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RESEARCH MEMORANDUM

for the

Air Materiel Command, Army Air Forces

DEVELOPMENT OF INBOARD NACELLE FOR THE XB-36 AIRPLANE

By

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DEVELOPMENT OF INBOARD NACELLE FOR THE XB-36 AIRPLANE

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SUMMARY

A series of investigations of several 1/14-scale models of an inboard nacelle for the XB-36 airplane was made in the Langley two-dimensional low-turbulence tunnels. The purpose of these investigations was to develop a low-drag wing-nacelle pusher combination which incorporated an internal air-flow system. As a result of these investigations, a nacelle was developed which had external drag coefficients considerably lower than the original basic form with the external nacelle drag approximately one-half to two-thirds of those of conventional tractor designs.

The largest reductions in drag resulted from sealing the gaps between the wing flaps and nacelle, reducing the thickness of the nacelle trailing-edge lip, and bringing the under-wing air inlet to the wing leading edge. It was found that without the engine cooling fan adequate cooling air would be available for all conditions of flight except for cruise and climb at 40,000 feet. Sufficient oil cooling at an altitude of 40,000 feet may be obtained by the use of flap-type exit doors.

INTRODUCTION

Airplane designs incorporating low-drag wings in combination with nacelles for pusher propellers offer the possibility of laminar flow over the portion of the wing ordinarily influenced by conventional tractor propellers. The use of leading-edge air inlets, which has been shown by experience to be an effecient means of inducting adequate cooling air may tend, however, to destroy the advantages of laminar flow if poorly designed. A well designed leading-edge air inlet operating in combination with an efficient ducting system would result in an appreciable reduction in airplane drag with adequate cooling air for the engine.

At the request of the Air Materiel Command, Army Air Forces, the development of a pusher-type inboard nacelle suitable for application to the XB-36 airplane was undertaken in the Langley two-dimensional low-turbulence tunnels.

In the development, successive modifications of a 1/14-scale nacelle model, mounted on the center section of a 3-foot span NACA 63(420)-422 (approximate) airfoil were tested primarily at a Reynolds number of 2.5×10^6 to determine the most efficient configuration for several typical flight conditions. The basic configuration, which was simply constructed, was submitted by the Consolidated Vultee Aircraft Corporation and was tested with a number of air-intake systems and external modifications. With such changes as seemed clearly desirable from these preliminary tests, the model was redesigned and the scaled ducts of the prototype airplane were installed.

The drag characteristics of the redesigned model were determined over the calculated flight range of lift coefficients for several flow conditions. Further modifications were made in an effort to improve the flow over the nacelle and through the ducting system. These modifications consisted of changing the duct inlet and subsequently extending the underwing air inlet to the leading edge. The resulting configurations were tested through the complete calculated flight range of lift coefficients for the flow conditions determined by the manufacturer. In addition, the effects on external drag of flap and flush type doors on the oil cooler and intercooler cooling-air duct outlets were determined.

The modifications were designed by members of the low-turbulence section in cooperation with members of the Consolidated Vultee Aircraft Corporation. All the data presented herein have been given previously in preliminary form.

COEFFICIENTS AND SYMBOLS

C_L airplane lift coefficient

c_l model lift coefficient

C_{D_F} nacelle total drag coefficient

C_{D_P} nacelle external drag coefficient

C_{D_i} calculated drag coefficient due to internal flow (exclusive of engine charge air)

q dynamic pressure $\left(\frac{1}{2}\rho V^2\right)$

ρ mass density

V velocity measured at point of subscript

F model nacelle frontal area (38.2 sq in.)

Q volume rate of flow through duct

c model wing chord (23.73 in.)

R Reynolds number based on actual chord $\left(\frac{\rho_o V_o c}{\mu}\right)$

A duct cross-sectional area

$\frac{\Delta H}{q_o}$ average total-pressure defect coefficient

$\frac{\Delta P}{q_o}$ total-pressure loss coefficient across baffle

$\frac{V_n}{V_o}$ inlet-velocity ratio $\left(\frac{F}{A_n}\left(\frac{Q}{FV_o}\right)_n\right)$

μ coefficient of viscosity

Subscripts:

o in free stream

n in duct inlet

e in duct exit

MODELS AND APPARATUS

All configurations discussed herein represented an inboard nacelle for the XB-36 airplane and were constructed to 1/14-scale. The nacelle, designed for pusher propellers, was mounted on the center section of a 23.73-inch chord wing section of 36-inch span and was built to the contour of the NACA 63(420)-422 (approximate) airfoil. Ordinates for the plain airfoil and flap are given in percent of airfoil chord in figure 1. The wing section was equipped with a 0.226c slotted flap. The flap was retracted and the gaps between the flap ends and the nacelle (fig. 2) were sealed for all runs presented herein except where otherwise noted.

Original Basic Configurations

Configuration A.- This configuration was designed and constructed by the Consolidated Vultee Aircraft Corporation with no attempt being made to simulate the ducts of the prototype. As sketched in figure 3, the leading-edge air inlet had a flat top and bottom with semi-circular ends. Cooling air was admitted through this opening and also through the underwing air inlet located at approximately the 0.55c station. All the air was exhausted through an annular slot about the propeller spinner. A separating plate (fig. 2) was installed to prevent mixing of the two air streams within the nacelle and, upon adjustment permitted the proper division or flow between the upper and lower surfaces. To regulate the flow, spinners of various diameters were used.

The external fairings added to the model are shown in figure 4.

Configuration B.- The leading-edge air inlet was designed to handle all of the air required by the engine (fig. 5) thus eliminating the necessity for the underwing air inlet and separating plate of configuration A. The modifications of configuration B involved a change in the exit shape and methods of sealing the flap nacelle gaps. (See fig. 6.)

Configuration C.- The leading-edge air inlet was designed on the basis of recommendations made in reference 1 and was approximately diamond shaped as shown in figure 7. The trailing edge of the nacelle was sharp; otherwise the model remained unchanged from configuration A.

Final Ducted Configurations

Configurations 1 and 2.- The design of configurations 1 and 2 differ only in the shape and position of the lower lip of the leading-edge air inlet as shown in figure 8. Ordinates and a sketch for both nose forms, measured along the nacelle center line and given in percent of airfoil chord, are presented in figure 9. Cooling air for the engine, intercoolers, and cabin entered a common duct at the wing leading edge while air for the oil cooler and engine charge entered through separate ducts in the underwing air inlet, located at approximately the 0.55c station, as shown in figure 10(a). At the rear spar, the leading-edge duct separates into four parts as shown in figure 10(b).

The engine, intercooler, and cabin air exhausted through the outlets shown in figure 10(c); the oil cooler and engine charge air through the outlets indicated in figure 10(d).

The engine air-flow rate was regulated by sliding the circular tapered plug in the engine air-exit slot fore and aft. Figure 10(c) shows the plug in the extended position closing the slot while figure 10(d) shows this plug in its extreme retracted position forming the maximum outlet opening. The intercooler, oil cooler, and cabin air-flow rates were also regulated at the respective outlets. Doors for the intercooler and cabin air-duct outlets were designed to slide parallel to the wing surface, whereas the oil-cooler closure was designed to represent a hinged flap. These conditions were adhered to in the tests except where otherwise noted; that is, one test was made with a hinged flap on the intercooler cooling-air outlet and five with a sliding plate on the oil-cooler cooling-air outlet. The flow through the engine charge-air ducts was regulated by inserting a clay constriction about 4 inches behind the air-inlet positions.

Multiple-hole orifice plates referred to herein as baffles were inserted in the ducts where resistances simulating heat exchangers (fig. 8) were required. The light lines appearing on the model in figures 10(a) and 10(c) show the sealed slots in which the oil-cooler and intercooler baffle plates were inserted. The engine baffle was mounted about the spinner stem with the pressure drop coefficients $\frac{\Delta P}{q_o}$ called for in the test specifications (table 1) being set by covering a sufficient number of the orifice holes with cellulose tape. No heat was added to simulate actual flow conditions.

Configuration 3.- This configuration incorporated the second nose form (fig. 9) in combination with the underwing air inlet extended to the leading edge as shown in figure 11. Air for the oil-cooler and engine charge entered the common lower duct at the wing leading edge. (See fig. 12(a).) The air flow through the engine-charge-air ducts was regulated by inserting a clay constriction within the ducts at a point near the exit, otherwise the manner of adjusting the flow rates through the remaining ducts was the same as previously indicated. Two additional views of the model are given in figures 12(b) and 12(c) while figures 13(a) to 13(c) shows the air inlets and outlets sealed for the no-flow condition. Figures 14(a) and 14(b) pictures the model with the flaps deflected 38.5°.

TESTS AND TEST METHODS

Tests of the model were made in the Langley two-dimensional low-turbulence tunnels. The tests included measurements at a Reynolds number of approximately 2.5×10^6 of lift, drag, internal duct losses, total-pressure surveys at various stations within the ducts, and the distribution of pressure over the wing and along the center line of the nacelle. The air-flow characteristics over the nacelle, at the air inlets, and in the wing nacelle junctures were determined by photographing the reaction of tufts. Drag measurements of configuration 3 were also made at a Reynolds number of 6×10^6 to determine the scale effect for the simulated cruise condition at 40,000 feet. (See table 1.)

Lift.- Theoretical curves of C_L plotted against airplane angle of attack and C_L plotted against c_l for the wing section at the center line of an inboard nacelle of the XB-36 airplane in the trim condition were submitted by the manufacturer. The section lift coefficients on these plots were based on a span load distribution for the wing without nacelles. The use of these curves enabled the investigation to be made at model lift coefficients corresponding to the actual flight lift coefficients of the airplane.

A series of lift curves were determined at arbitrary values of Q/FV_o for several wing-nacelle combinations by the methods described in reference 2. The results of these tests indicated no appreciable changes in the lift characteristics of the model with change in flow for given angles of attack throughout the complete range of flight lift coefficients. The lift coefficients of the remaining configurations were, therefore, determined in the simplest manner, that is, with the cooling-air outlets approximately half open and with the baffles removed from the ducts. All lift coefficients have been corrected for tunnel-wall constriction effects.

Drag.- The wake-survey method was used to measure drag. The integral of the loss of total pressure in the wake, which results in a fairly close approximation to the drag, was measured with an integrating manometer as described in reference 2. Insofar as possible, the wing and nacelle were maintained in an aerodynamically smooth condition during all drag tests. Nacelle drag coefficients were based on the nacelle frontal area of 38.2 square inches, which is equivalent to 52 square feet full scale. The values of the total nacelle drag coefficient were determined from plots of the spanwise surveys, a typical example of which is given in figure 15. The area under the curve was first determined. From this, the area equivalent to the plain wing drag was subtracted, the net area K representing the drag of the nacelle, including internal losses. This area K was then used in the equation:

$$C_{D_F} = \frac{K \times c \times \text{scale factor}}{F} - \text{internal drag of engine charge-air ducts}$$

The internal drag coefficients C_{D_i} were determined prior to the drag tests by using the average rate of flow and loss of impact pressure measured at the cooling-air duct outlets by pitot-static tube surveys. The relation used to compute the internal drag coefficient, assuming incompressible flow, is as follows:

$$C_{D_i} = 2\left[1 - \left(1 - \frac{\Delta H_e}{q_o}\right)^{\frac{1}{2}}\right]\frac{Q}{FV_o}$$

The external nacelle drag coefficient was obtained by subtracting elements representing the internal loss from the total nacelle drag coefficient, that is,

$$C_{D_P} = C_{D_F} - C_{D_i}$$

where C_{D_i} represents the internal drag of all the ducts with the exception of the internal drag contributed by the engine charge-air duct (s) which was originally subtracted in determining the total nacelle drag coefficient.

RESULTS AND DISCUSSION

Original Basic Configurations

Since the actual internal flow conditions were not simulated for configurations A, B, and C, due to the simplicity of the ducting system, the detailed results are not presented; however, the modifications and their effects on drag are briefly discussed.

Configuration A.- Revising the cooling-air exit lip of configuration A (fig. 3(c)) to form a sharp lip (fig. 4(d)) reduced the nacelle drag coefficient about 13 percent while the fairings added to the model (fig. 4(a), 4(b), and 4(c)) did not markedly improve its characteristics. Throughout all subsequent tests the sharp exit lip was therefore retained.

Configuration B.- When the gaps between the flap ends and the nacelle (fig. 6(b)) were sealed, the nacelle drag coefficient was considerably reduced, the amount of the drag reduction being relatively unaffected by the type of seal used. (See fig. 6(d), and 6(e).) Consequently, the remainder of the tests were made with the flap nacelle gaps sealed. In an attempt to further reduce the drag of configuration B, a metal cone (fig. 6(a)) was used in place of the spinner. Although this arrangement resulted in a small decrease in nacelle drag, it was not considered sufficient to warrant continued tests when viewed in the light of the probable weight increase entailed.

Configuration C.- Laminar flow extended over a greater percentage of the chord of configuration C (fig. 7) than either of the earlier configurations. As a result, the external nacelle drag of configuration C was lower than the drag of either of the earlier configurations for all flow rates investigated. During the latter part of the investigation, it was found by tuft observations that turbulent flow was occurring in the wing-nacelle junctures behind the 0.75c station on the upper surface. The tests were, therefore, discontinued and a more representative model, designed to discharge the intercooler cooling air in the wing-nacelle junctures, was constructed. Such a design, it was thought, would reduce the turbulence in the wing-nacelle junctures whereupon the external drag would be further reduced.

Final Ducted Configurations

The test conditions specified by the manufacturer are given in table 1. The remarks given in table 1 indicate the changes in the model configurations as tested for the various runs. The test results for configurations 2 and 3 are recorded in table 2 at a model lift coefficient of 0.83 (C_L = 0.70) which corresponds approximately to the cruise lift coefficient of the airplane. It is to be noted that the results for similar conditions of configurations 2 and 3 are given on the same line (table 2) for comparative purposes. The complete test results for configurations 1, 2, and 3 are presented in tables 3 to 5, 6 to 21, and 22 to 44, respectively. Plots of model lift coefficient against model angle of attack for configuration 3 are shown in figure 16.

Preliminary surveys.- A preliminary survey of the total-pressure losses in the engine cooling-air duct of configuration 1 was made at the rear face of the baffle and at the cooling-air outlet to determine the percentage loss in total pressure between the two chordwise stations. It was found that the average loss was about 1 percent of the free-stream dynamic pressure which is considered negligible. The specified pressure drop coefficients $\frac{\Delta P}{q_o}$ (table 1) across the baffles were therefore determined by subtracting the average total pressure at the exit from that at the front face of the baffle.

An additional survey of configuration 1 was made with the flow through the ducts adjusted to simulate the high-speed condition at 30,000 feet in order to determine the external nacelle drag with and without baffles in the ducts. (See fig. 17.) It is of interest to note that for this high velocity exit condition the external nacelle drag was relatively unaffected by the presence of baffles in the ducts provided the same values of $\frac{Q}{FV_o}$ were retained.

The results obtained from tests of configuration 3 with the baffles removed from the ducts (tables 22 to 28) are presented in figure 18 as the variation of average total-pressure defect $\frac{\Delta H_e}{q_o}$ at the cooling air outlets with flow coefficient $\frac{Q}{FV_o}$. In order to simplify the tests, these results were used in some cases as the average total pressure measurements at the front face of the baffles. This was permissible since it had been shown previously that the loss in total pressure between the baffle and the cooling-air outlet was negligible.

Drag at high speed and maximum flow.- Due to the large total pressure losses measured in the engine cooling-air duct at lift coefficients above about 0.700, the external nacelle drag coefficients of configuration 1 were only measured for the simulated high-speed and maximum flow conditions. These data are presented in figures 19 and 20, respectively. Included in figures 19 and 20 are the drag results obtained from tests of configurations 2 and 3 for corresponding flow conditions. Cutting back the lower lip of the leading-edge duct inlet of configuration 1 to form the second nose (configuration 2) showed an improvement in the pressure recovery in the leading-edge duct. The external nacelle drag of configuration 2 for both the high-speed (fig. 19, $C_L = 0.425$) and maximum flow (fig. 20, $C_L = 0.912$) conditions was, however, increased 13 and 18 percent, respectively, above that of configuration 1. The improvement in nacelle contour by extending the underwing air entrance to the leading edge (configuration 3) produced the largest reduction in external nacelle drag. The over-all reduction from configuration 2 varied from 45 percent for the high-speed condition to 39 percent for the maximum flow condition.

Effects on drag of flow through intercooler cooling-air ducts.- To determine the effect on external nacelle drag of the intercooler cooling-air outlets located at the wing nacelle junctures, the intercooler cooling-air outlets were sealed (run 22/24, configuration 2) and the engine cooling-air duct exit plug was opened until the leading-edge duct inlet-velocity ratio was about the same as run 22. Figure 21 shows that the external drag was decreased approximately 25 percent through the entire range of lift coefficients investigated with the intercooler cooling-air outlets open. It is to be noted that the specified pressure drop across the baffle simulating the engine was unobtainable with the required flow coefficient. Consequently, the exit was set for maximum flow and the pressure drop across the baffle was adjusted to give the specified value of $\frac{Q}{FV_o}$.

An attempt was made to reduce the drag of the nacelle by having the intercooler closure slide spanwise away from the nacelle (run 15x) rather than in the normal chordwise direction (run 15) in order to retain a greater part of the exiting air in the wing nacelle juncture. (See configuration 2.) The test results for this low nacelle air-flow condition, presented in figure 22, show no appreciable change in the drag characteristics. As no decrease in external nacelle drag was expected with the spanwise sliding door at a high nacelle air-flow condition, no further tests with this type door were made.

The effects on nacelle drag of closing in varying combinations the intercooler and engine charge-air outlets of configurations 2 and 3 are shown in figure 23. The use of two intercoolers and two engine charge-air ducts (configuration 2) reduced the external nacelle drag about 13 percent below that of either one or two intercooler ducts operating in combination with one engine charge-air duct (C_L = 0.667). The external nacelle drag of configuration 3 with one intercooler and one ~~engine~~ charge-air duct or two intercoolers and one engine charge-air duct open was, respectively, about 49 and 42 percent less than that of configuration 2 at a lift coefficient of 0.667.

The required pressure drop across the baffle simulating the engine for the runs indicated in figure 23 was unobtainable with the required flow coefficient. Since runs 21 and 18 (fig. 23) represent the cruise condition at 40,000 feet, adequate engine cooling for this flight condition may be obtained only with the cooling fan in operation.

The effects on nacelle drag of increased flow through the intercooler cooling-air ducts are shown in figure 24. Runs 20 and 21 represent the conditions of the model (configuration 3) where the baffle adjustment in both the intercooler and engine cooling-air ducts was the same as for run 19. (See table 1.) Under these conditions the maximum available flow coefficient at the intercooler cooling-air duct outlets for run 20 was about 16 percent less than the required value. The results indicate that the external nacelle drag increases as the intercooler flow increases. At the flow rates required for runs 20 and 21 the doors on the intercooler cooling-air duct outlets, although flush with the wing surface, were wide open. With the doors wide open the air was exiting from the duct at a low velocity. Due to the design of the outlet and the low velocity the air emerged upward and away from the wing-nacelle junctures rather than parallel to the wing surface and into the wing nacelle junctures where it has been shown to reduce the drag. (See fig. 21.)

Drag at cruise and climb.- Comparisons of the drag characteristics between configurations 2 and 3 for the simulated cruise condition at altitudes ranging from 10,000 to 40,000 feet and the simulated climb condition at 40,000 feet are presented in figures 25 and 26, respectively. The results given in figures 25 and 26 for the cruise (C_L = 0.69) and climb (C_L = 0.91) conditions are plotted in figure 27 to show the effects on external nacelle drag of increasing $\frac{Q}{FV_o}$ and varying, in combinations, the types of doors on the oil-cooler and intercooler cooling-air exits.

It is seen in figure 25 that with the increasing flow required for increasing altitudes (one intercooler and one turbo) the total nacelle drag increases. The internal drag is shown to increase more rapidly than the total nacelle drag resulting in a gradual decrease in external nacelle drag with increasing flow. The results of configuration 3 show a considerable improvement over those of configuration 2.

Figure 27 shows that small variations in external nacelle drag with changes in type of doors on the oil-cooler cooling-air duct outlet were obtained for the simulated cruise condition at altitudes of 10,000 and 30,000 feet. For the simulated climb condition at 40,000 feet a substantial reduction in nacelle drag results with flush-type doors on both the oil-cooler and intercooler cooling-air duct outlets. Examination of tables 1 and 43, however, reveals that a flush-type door on the oil-cooler cooling-air duct outlet does not provide the necessary pressure differences for sufficient cooling while climbing at 40,000 feet. Sufficient oil cooling at an altitude of 40,000 feet may be obtained, however, by the use of flap-type doors. It is of interest to note that for the simulated climb condition at 40,000 feet the flap-type exit door on the oil-cooler cooling-air duct outlet extended about 27° below the surface of the nacelle. By redesigning the cooling-air outlet to decrease the maximum flap deflection required for this flight condition, some improvement in external nacelle drag may be realized.

With either the flush or flap-type doors on the intercooler cooling-air duct outlets sufficient cooling air should be available for climb at 40,000 feet.

It has been pointed out that air passing through the intercooler cooling-air duct has a beneficial effect on external nacelle drag. In order to keep the external nacelle drag at a minimum it is of considerable importance that the exiting air be directed into the wing-nacelle junctures. With flap-type doors on the intercooler cooling-air duct outlets (fig. 26) the air flowing over the wing is deflected upward upon coming into contact with the upward opening flap. The cooling air exiting from the outlet, in mixing with the air flowing over the outer surface of the flap, creates turbulent flow. As a result, a sizeable increase in external drag is obtained. From the drag standpoint, therefore, flush-type doors on the intercooler cooling-air outlets are superior to flap-type doors.

Total-pressure deflect in engine cooling-air duct.- The variation of the average total-pressure deflect with chordwise position within the engine cooling-air duct for the high-speed and climb conditions at 30,000 and 40,000 feet are presented in figures 28(a) and 28(b), respectively. (See configuration 3.) Included in figure 28(a) are two test points which were obtained from surveys in the engine cooling-air duct of configuration 1. These results show that with the second nose form the losses at the rear spar and at the rear of the diffuser are reduced about one-half.

No and partial flow through nacelle.- The drag results for the no- and partial-flow conditions (configuration 2) and the no-flow condition (configuration 3) are presented in figures 29 and 30, respectively. In order to simulate the no-flow condition the air inlets and outlets were sealed with modeling clay.

A comparison of runs 25(a) and 25(b) (fig. 29) indicates that with only the exits sealed a large increase in external nacelle drag results. This increase in external nacelle drag is caused from air spillage over the lips of the leading edge and under wing air inlets. Small changes in external drag from run 25(b) are seen from a comparison with runs 25(c) and 25(d). These data indicate that air flowing through either the leading edge or underwing air inlet does not appreciably effect the external nacelle drag as long as the flow through the ducts is sufficient to keep the air from spilling over the lips. For the no-flow condition, the fairer contour obtained with the scoop extended to the wing leading edge (configuration 3, fig. 30) reduced the external nacelle drag approximately 15 percent below that of configuration 2 (fig. 29, run 25(b)) at a lift coefficient of 0.70.

Scale effect on drag for cruise at 40,000 feet.- The results presented in figure 31 show the effect of increased Reynolds number on nacelle drag for the cruise condition at 40,000 feet. (See configuration 3.) Run 18(a) represents the condition of the model in which the baffle adjustments and cooling-air outlet areas were the same as for run 18. Since scale effect on pressure drop is not normally the same for the baffle as for the full-scale installation, no attempt was made to measure the total-pressure losses at the face of the baffle.

Design considerations.- The external drag coefficients of the present inboard nacelle with the underwing air inlet extended to the leading edge (configuration 3) are approximately one-half to two-thirds of those of conventional tractor designs at the same ratio of wing thickness to nacelle diameter as indicated in references 3 and 4. Propeller operation, as shown in reference 5 may tend to alleviate the stall condition at the trailing edge of the wing in the vicinity of the nacelle at high lift coefficients. It is believed, therefore, that further reductions in nacelle drag may be realized with power on.

It should be noted that nacelle configuration 3 differs from those on the three-dimensional installation described in reference 5 due to wing sweepback, plan form, and thickness taper. The results presented in this paper, therefore, may be influenced by these factors.

CONCLUSIONS

The results of tests of the wing-nacelle combinations of this report indicate the following:

1. Large reductions in drag result from sealing the gaps between the wing flaps and nacelle and by refairing the nacelle trailing edge to form a sharp lip.

2. The improvement in nacelle contour obtained by extending the underwing air entrance to the leading edge (configuration 3) produced the largest reduction in drag.

3. Sufficient oil-cooling at an altitude of 40,000 feet may be obtained by the use of flap-type exit doors.

4. From the drag standpoint, flush-type doors on the intercooler cooling-air duct outlets are superior to flap-type doors.

5. Without the engine cooling fan adequate engine cooling air will be available for all conditions of flight except for cruise and climb at 40,000 feet.

6. Increasing the stagger angle and the lower lip radius of the leading-edge duct to form the second nose improved the pressure recovery of the engine cooling-air duct in the lift coefficient range above 0.700.

7. Air passing through the intercooler cooling-air duct outlet has a beneficial effect on the external drag provided the exiting air flows into the wing-nacelle juncture.

8. The external drag decreased as the total flow rate increased.

9. The external drag increments due to the nacelle with the underwing air inlet extended to the leading edge (configuration 3) are approximately one-half to two-thirds of those of conventional tractor designs.

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[redacted]

TABLE 1.- TEST SPECIFICATIONS FOR 1/14-SCALE MODEL OF XB-36 INBOARD NACELLE

[Except as noted, all runs made in Langley LTT at Reynolds number of approximately 2.5×10^6 with the flaps retracted and the gaps between the flaps and nacelle sealed with modeling clay; when single intercooler or engine charge-air operation is required, the right hand exits are sealed; flap and flush type exit doors were used respectively on oil-cooler and intercooler cooling air outlets unless otherwise specified.]

Run Configuration		Engine Cooling air		Oil cooler cooling air		Intercooler cooling air		Cabin air	Engine charge air	Altitude (ft)	Flight condition	C_L	Number of ducts open		Remarks
2	3	$\frac{Q}{FV_o}$	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	$\frac{Q}{FV_o}$				Intercooler	Engine charge air	
15	1	0.0020	——	0.0032	——	0.0013	——	0	0.0022			0.685	1	1	-Low nacelle air flow
15x		.0020	——	.0032	——	.0013	——	0	.0022				1	1	- Intercooler exit door made to slide spanwise away from nacelle, otherwise same as run 15
	2	.0252	——	.0068	——	.0010	——	.0006	.0030	10,000	cruise	.685	1	1	
	3	.0327	——	.0094	——	.0035	——	.0009	.0049	30,000	cruise	.698	1	1	
	4	.0370	——	.0130	——	.0069	——	.0014	.0059	40,000	cruise	.667	1	1	
	5	.0450	——	.0176	——	.0083	——	.0015	.0113	40,000	climb	.912	1	2	
	5	.0200	——	.0032	——	.0026	——	0	.0022				2	1	
	7	.0450	——	.0176	——	.0165	——	.0015	.0113	40,000	climb	.912	2	2	
	8	.0200	0.156	.0032	0.024	.0013	0.029	0	.0022				1	1	
16	9	.0252	.284	.0068	.105	.0010	.017	.0006	.0030	10,000	cruise	.685	1	1	
16x		.0252	.284	.0068	.105	.0010	.017	.0006	.0030	10,000	cruise	.685	1	1	- Check on run 16
	a10	.0252	.284	.0068	.105	.0010	.017	.0006	.0030	10,000	cruise	.685	1	1	
	11	.0252	.284	.0068	.105	.0010	.017	.0006	.0030				1	1	$-\delta_f = 20^{\circ}$ c_l versus α; gaps between flaps and nacelle unsealed
	12	.0252	.284	.0068	.105	.0010	.017	.0006	.0030				1	1	$-\delta_f = 38.5^{\circ}$
17	13	.0283	.358	.0072	.134	.0020	.037	.0007	.0038	20,000	cruise	.685	1	1	
18	14	.0327	.513	.0094	.210	.0035	.097	.0009	.0049	30,000	cruise	.698	1	1	
	a15	.0327	.513	.0094	.210	.0035	.097	.0009	.0049	30,000	cruise	.698	1	1	
20	17	.0333	.556	.0110	.281	.0046	.189	.0012	.0053	35,000	cruise	.685	1	1	- (d) TDT
21	18	.0370	.730	.0130	.397	.0069	.360	.0014	.0059	40,000	cruise	.667	1	1	- $R = 6 \times 10^6$, (d) TDT
	18a	.0370		.0130		.0069		.0014	.0059				1	1	
22		.0370	.730	.0130	.397	.0097	.199	.0014	.0059				2	2	
22x		.0370	.730	.0130	.397	.0097	.199	.0014	.0059				2	1	- Intercooler exits faired, v_n/v_o about same as run 22 resulting in Q/FV_o through engine cooling air duct equal to run 24
22/24													0	2	
	19	.0370	.730	.0130	.397	.0097	.215	.0014	.0059				2	1	- Effect of increased intercooler flow on external drag
	20	.0257	(c)	.0130	.397	.0200	(c)	.0014	.0059				2	1	
	21	.0302	(c)	.0068	.105	.0169	(c)	.0006	.0030				2	1	
23x	22	.0286	.376	.0094	.206	.0057	.063	.0006	.0078	30,000	high speed	.425	2	2	
24x	24	.0450	max	.0172	.667	.0165	.527	.0015	.0113	40,000	climb	.912	2	2	
a24y	a25	.0450	max	.0172	.667	.0165	.527	.0015	.0113	40,000	climb	.912	2	2	
b24		.0450	max	.0172	.667	.0165	.527	.0015	.0113	40,000	climb	.912	2	2	
14x		max	——	max	——	max	——	max	max				2	2	- All exits wide open
	a26	max	——	max	——	max	——	max	max				2	2	
25a		0	——	0	——	0	——	0	0				0	0	- All exits faired; leading edge and scoop inlets open
25b	23	0	——	0	——	0	——	0	0				0	0	- All inlets and exits faired
25c		0	——	.0068	.105	0	——	0	.0030				0	1	- Leading-edge inlet and exits faired, scoop inlets and exits open
25d		.0252	.284	0	——	.0010	.017	.0006	0				1	0	- Scoop inlets and exits faired, leading-edge inlet and exits open

[a]Flush type door on oil-cooler cooling-air duct exit.
[b]Flap type door on intercooler cooling-air duct exit.
[c]Same baffle setting as run 19.
[d]Two-dimensional low-turbulence pressure tunnel.

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TABLE 2.— TEST RECORD

[Results presented for C_L = 0.700]

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Configuration 2

Run	Figure	Table	Engine cooling air $\frac{Q}{\rho V_o}$	Engine cooling air $\frac{\Delta p}{q_o}$	Oil cooler cooling air $\frac{Q}{\rho V_o}$	Oil cooler cooling air $\frac{\Delta p}{q_o}$	Intercooler cooling air $\frac{Q}{\rho V_o}$	Intercooler cooling air $\frac{\Delta p}{q_o}$	Cabin air $\frac{Q}{\rho V_o}$	Engine charge air $\frac{Q}{\rho V_o}$	C_{D_F} (a) Total	C_{D_F} (a) External
15	22	7	0.0306	—	0.0032	—	0.0012	—	0	0.0020	0.0692	0.0675
15x	22	8	.0306	—	.0038	—	.0012	—	0	.0020	.0600	.0661
16	25(a)	9	.0265	0.282	0.0088	0.101	.0010	0.015	.0006	.0032	Average .0627	.0489
16x	25(a)	10	.0299	(b)	.0071	(b)	.0009	(b)	.0005	.0032		
17	25(b)	11	.0280	.351	.0076	.148	.0018	.036	.0007	.0034	.0614	.0482
19	25(c)	12	.0313	.515	.0095	.236	.0037	.100	.0009	.0043	.0755	.0444
20	25(d)	13	.0309	.552	.0105	.310	.0047	.199	.0012	.0053	.0790	.0443
21	22, 25(e)	14	.0378	.533	.0139	.403	.0069	.344	.0014	.0060	.0880	.0417
22	21, 23	15	.0378	.533	.0139	.403	.0101	.198	.0014	.0059	.0849	.0373
22x	23	16	.0378	.533	.0139	.403	.0101	.198	.0014	.0060	.0890	.0417
22x24	21	17	.0437	.241	.0139	.403	0	0	.0014	.0059	.0880	.0496
23x	19	18	.0284	.386	.0109	.219	.0056	.066	.0007	.0075	.0680	.0462
24x	26	20	.0504	(b)	.0165	(b)	.0163	(b)	.0015	.0115	.1154	.0403
24y	25	21	.0504	(b)	.0170	(b)	.0163	(b)	.0008	.0115	.1015	.0408
24	26	19	.0437	.241	.0172	.464	.0177	.500	.0015	.0114	.1255	.0590
14x	20	6	.0550	—	.0898	—	.0207	—	.0029	.0146	.0985	.0494
25a	29		0	—	0	—	0	—	0	0		.0663
25b	29		0	—	0	—	0	—	0	0		.0518
25c	29		0	—	.0069	.109	0	—	0	.0038	.0522	.0509
25d	29		.0263	.282	0		.0010	.014	.0006	0	.0598	.0479

Configuration 3

Run	Figure	Table	Engine cooling air $\frac{Q}{\rho V_o}$	Engine cooling air $\frac{\Delta p}{q_o}$	Oil cooler cooling air $\frac{Q}{\rho V_o}$	Oil cooler cooling air $\frac{\Delta p}{q_o}$	Intercooler cooling air $\frac{Q}{\rho V_o}$	Intercooler cooling air $\frac{\Delta p}{q_o}$	Cabin air $\frac{Q}{\rho V_o}$	Engine charge air $\frac{Q}{\rho V_o}$	C_{D_F} (a) Total	C_{D_F} (c) External
1	18	22	0.0213	—	0.0032	—	0.0015	—	0	0.0080	(b)	(b)
2	18	23	.0273	—	.0072	—	.0010	—	.0006	.0030	(b)	(b)
3	18	24	.0339	—	.0094	—	.0036	—	.0009	.0046	(b)	(b)
4	18	25	.0402	—	.0131	—	.0068	—	.0015	.0059	(b)	(b)
5	18	26	.0475	—	.0171	—	.0084	—	.0015	.0106	(b)	(b)
6	18	27	.0213	—	.0032	—	.0097	—	0.	.0082	(b)	(b)
7	18	28	.0457	—	.0173	—	.0169	—	.0014	.0106	(b)	(b)
8		29	.0199	0.153	.0038	0.021	.0013	0.030	0.	.0022		
9	16, 25(a)	30	.0250	.305	.0070	.099	.0011	.013	.0006	.0030	0.0599	0.0401
10	25(a)	31	.0250	.305	.0067	.099	.0011	.013	.0006	.0030	.0616	.0391
11	16											
12	16											
13	25(b)	32	.0281	.362	.0071	.189	.0072	.041	.0007	.0039	.0501	.0338
14	25(c)	33	.0337	.580	.0097	.203	.0034	.095	.0009	.0045	.0578	.0292
15	25(d)	34	.0337	.580	.0093	.215	.0034	.095	.0009	.0049	.0600	.0275
17	25(d)	35	.0304	.562	.0115	.280	.0044	.194	.0011	.0054	.0652	.0307
18	25(e), 31	36	.0371	.564	.0134	.401	.0067	.367	.0015	.0053	.0670	.0215
18x	31	37	.0366	(b)	.0135	(b)	.0070	(b)	.0015	.0047	.0673	.0254
19	24	38	.0364	.537	.0134	.379	.0094	.185	.0014	.0051	.0689	.0249
20	24	39	.0264	.278	.0137	.401	.0167	.680	.0014	.0055	.0772	.0379
21	24	40	.0316	.383	.0070	.112	.0182	.680	.0006	.0031	.0635	.0336
22	19	41	.0293	.403	.0094	.204	.0054	.061	.0006	.0079	.0455	.0257
24	26	42	.0440	.457	.0272	.635	.0166	.539	.0015	.0098	.1075	.0396
25	26	43	.0440	.457	.0180	.137	.0166	.539	.0015	.0007	.0982	.0270
26	20	44	.0615	—	.0196	—	.0251	—	.0035	.0098	.0619	.0318
23	30		0		0		0		0	0		.0439

[a]Obtained from faired curve plotted against C_L.

[b]Not measured.

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TABLE 3 .- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 1 CONFIGURATION 1.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0053	0.0465	0.0412	0.43	—	0.128	—	0.0095	0.0013	—	0.681	—	0.0078	0.0068
5.0	.595	.715	.0052	.0473	.0421	.43	—	.112	—	.0094	.0011	—	.670	—	.0079	.0067
6.2	.700	.825	.0052	.0478	.0426	.42	—	.104	—	.0092	.0010	—	.656	—	.0078	.0065
7.0	.775	.900	.0055	.0515	.0460	.42	—	.100	—	.0092	.0009	—	.651	—	.0078	.0064
8.2	.885	1.015	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9.0	.950	1.086	.0091	.0583	.0492	.42	—	.090	—	.0090	.0008	—	.641	—	.0078	.0062

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.49	—	0.114	—	0.0310	0.0037	—	0.056	—	0.0053	0.0003	—	0.096	—	0.0006	0.0001
.715	.49	—	.114	—	.0310	.0037	—	.056	—	.0054	.0003	—	.104	—	.0006	.0001
.825	.49	—	.120	—	.0307	.0039	—	.059	—	.0054	.0003	—	.106	—	.0006	.0001
.900	.48	—	.130	—	.0302	.0041	—	.062	—	.0054	.0004	—	.103	—	.0006	.0001
1.015	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.085	.45	—	.238	—	.0280	.0072	—	.177	—	.0053	.0010	—	.192	—	.0006	.0001

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TABLE 4 .- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 14 CONFIGURATION I.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
AIRPLANE		C_l	C_{D_I}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0476	0.0850	0.0374	1.11	—	0.451	—	0.0313	0.0163	—	0.238	—	0.0135	0.0034
5.0	.595	.715	.0476	.0932	.0456	1.10	—	.430	—	.0310	.0152	—	.229	—	.0134	.0033
6.2	.700	.825	.0475	.0886	.0411	1.09	—	.417	—	.0306	.0145	—	.226	—	.0134	.0032
7.0	.775	.900	.0479	.0908	.0429	1.09	—	.416	—	.0303	.0143	—	.223	—	.0134	.0032
8.2	.885	1.015	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9.0	.950	1.085	.0539	.0991	.0452	1.06	—	.397	—	.0296	.0132	—	.217	—	.0132	.0030

UPPER DUCT INLET																
		ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	1.09	—	0.365	—	0.0560	0.0233	—	0.258	—	0.0229	0.0064	—	0.481	—	0.0030	0.0017
.715	1.08	—	.382	—	.0549	.0241	—	.262	—	.0232	.0066	—	.492	—	.0030	.0017
.825	1.07	—	.392	—	.0540	.0245	—	.265	—	.0233	.0067	—	.500	—	.0031	.0018
.900	1.05	—	.412	—	.0526	.0250	—	.268	—	.0233	.0068	—	.506	—	.0031	.0018
1.015	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.085	.93	—	.545	—	.0443	.0291	—	.374	—	.0224	.0094	—	.575	—	.0031	.0022

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TABLE 5.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 23

CONFIGURATION 1.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0223	0.0627	0.0404	0.44	0.208	0.408	0.200	0.0098	0.0045	—	0.681	—	0.0078	0.0068
5.0	.595	.715	.0217	.0620	.0403	.44	.183	.387	.204	.0097	.0042	—	.670	—	.0079	.0067
6.2	.700	.825	.0214	.0628	.0414	.43	.165	.369	.204	.0096	.0040	—	.656	—	.0078	.0065
7.0	.775	.900	.0214	.0644	.0430	.43	.151	.359	.208	.0096	.0038	—	.651	—	.0078	.0064
8.2	.885	1.015	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9.0	.950	1.085	.0226	.0768	.0542	.43	.123	.331	.208	.0094	.0034	—	.641	—	.0078	.0062

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.47	0.117	0.486	0.379	0.0292	0.0170	0.061	0.122	0.061	0.0057	0.0007	—	0.096	—	0.0006	0.0001
.715	.47	.120	.491	.371	.0291	.0167	.060	.121	.061	.0057	.0007	—	.104	—	.0006	.0001
.825	.47	.128	.491	.368	.0290	.0167	.063	.125	.062	.0057	.0007	—	.106	—	.0006	.0001
.900	.47	.146	.493	.347	.0291	.0167	.070	.130	.060	.0057	.0008	—	.103	—	.0006	.0001
1.015	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.085	.44	.259	.550	.291	.0270	.0178	.198	.221	.023	.0055	.0013	—	.192	—	.0006	.0001

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TABLE 6.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 14x CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.416	0.535	0.0499	0.1023	0.0524	1.13	—	0.472	—	0.0305	0.0167	—	0.147	—	0.0148	0.0023
5.0	.595	.715	.0494	.0965	.0471	1.11	—	.459	—	.0299	.0158	—	.139	—	.0146	.0021
6.2	.700	.825	.0489	.0983	.0494	1.10	—	.450	—	.0296	.0153	—	.135	—	.0146	.0020
7.0	.775	.900	.0487	.0991	.0504	1.09	—	.444	—	.0294	.0150	—	.133	—	.0146	.0020
8.2	.885	1.015	.0485	.1004	.0519	1.08	—	.436	—	.0290	.0144	—	.129	—	.0145	.0019
9.0	.950	1.085	.0491	.1029	.0538	1.07	—	.429	—	.0288	.0141	—	.127	—	.0144	.0019

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	1.03	—	0.402	—	0.0550	0.0250	—	0.294	—	0.0203	0.0065	—	0.513	—	0.0027	0.0017
.715	1.03	—	.402	—	.0551	.0251	—	.301	—	.0205	.0067	—	.524	—	.0028	.0017
.825	1.04	—	.402	—	.0550	.0250	—	.299	—	.0207	.0068	—	.533	—	.0029	.0018
.900	1.04	—	.403	—	.0549	.0250	—	.303	—	.0208	.0069	—	.538	—	.0029	.0018
1.015	1.04	—	.405	—	.0547	.0250	—	.310	—	.0209	.0071	—	.550	—	.0029	.0019
1.085	1.03	—	.416	—	.0540	.0259	—	.311	—	.0211	.0072	—	.558	—	.0030	.0020

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TABLE 7 .- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 15
CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0026	0.0774	0.0748	0.15	—	0.266	—	0.0028	0.0008	—	0.890	—	0.0021	0.0027
5.0	.595	.715	.0021	.0693	.0672	.17	—	.128	—	.0032	.0004	—	.880	—	.0022	.0029
6.2	.700	.825	.0021	.0695	.0674	.16	—	.113	—	.0032	.0004	—	.885	—	.0020	.0027
7.0	.775	.900	.0022	.0714	.0692	.16	—	.108	—	.0032	.0004	—	.877	—	.0020	.0027
8.2	.885	1.015	.0024	.0907	.0883	.17	—	.107	—	.0032	.0004	—	.868	—	.0021	.0027
9.0	.950	1.085	.0029	.1118	.1089	.17	—	.112	—	.0032	.0004	—	.864	—	.0022	.0027

UPPER DUCT INLET																
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.29	—	0.080	—	0.0207	0.0017	—	0.040	—	0.0012	0.0000	—	—	—	0	—
.715	.29	—	.079	—	.0206	.0017	—	.040	—	.0012	.0000	—	—	—	0	—
.825	.29	—	.081	—	.0206	.0017	—	.036	—	.0012	.0000	—	—	—	0	—
.900	.29	—	.084	—	.0206	.0018	—	.036	—	.0012	.0000	—	—	—	0	—
1.015	.29	—	.096	—	.0205	.0020	—	.038	—	.0012	.0000	—	—	—	0	—
1.085	.29	—	.119	—	.0205	.0025	—	.046	—	.0012	.0001	—	—	—	0	—

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TABLE 8 .- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 15x CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0026	0.0787	0.0761	0.15	—	0.266	—	0.0028	0.0008	—	0.890	—	0.0021	0.0027
5.0	.595	.715	.0021	—	—	.17	—	.128	—	.0032	.0004	—	.880	—	.0022	.0029
6.2	.700	.825	.0021	.0681	.0660	.16	—	.113	—	.0032	.0004	—	.885	—	.0020	.0027
7.0	.775	.900	.0022	—	—	.16	—	.108	—	.0032	.0004	—	.877	—	.0020	.0027
8.2	.885	1.015	.0024	—	—	.17	—	.107	—	.0032	.0004	—	.868	—	.0021	.0027
9.0	.950	1.085	.0029	.1227	.1198	.17	—	.112	—	.0032	.0004	—	.864	—	.0022	.0027

UPPER DUCT INLET																
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.29	—	0.080	—	0.0207	0.0017	—	0.036	—	0.0012	0.0000	—	—	—	0	—
.715	.29	—	.079	—	.0206	.0017	—	.034	—	.0012	.0000	—	—	—	0	—
.825	.29	—	.081	—	.0206	.0017	—	.028	—	.0012	.0000	—	—	—	0	—
.900	.29	—	.084	—	.0206	.0018	—	.032	—	.0012	.0000	—	—	—	0	—
1.015	.29	—	.096	—	.0205	.0020	—	.032	—	.0012	.0000	—	—	—	0	—
1.085	.29	—	.119	—	.0205	.0025	—	.040	—	.0012	.0000	—	—	—	0	—

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TABLE 9 .- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 16 CONFIGURATION 2.

Complete model: Airplane α	Complete model: Airplane C_L	C_Z	C_{D_i} Internal	C_{D_F} Total	C_{D_P} External	Lower duct inlet: $\frac{V_n}{V_o}$	Oil-cooler: $\frac{\Delta H}{q_o}$ Baffle	Oil-cooler: $\frac{\Delta H}{q_o}$ Exit	Oil-cooler: $\frac{\Delta P}{q_o}$	Oil-cooler: $\frac{Q}{FV_o}$	Oil-cooler: C_{D_i}	Left hand engine charge-air duct: $\frac{\Delta H}{q_o}$ Baffle	Left hand engine charge-air duct: $\frac{\Delta H}{q_o}$ Exit	Left hand engine charge-air duct: $\frac{\Delta P}{q_o}$	Left hand engine charge-air duct: $\frac{Q}{FV_o}$	Left hand engine charge-air duct: C_{D_i}
3.0	0.415	0.535	0.0136	0.0592	0.0456	0.32	0.159	0.261	0.102	0.0069	0.0019	—	0.776	—	0.0032	0.0034
5.0	.595	.715	.0134	.0607	.0473	.32	.137	.238	.101	.0069	.0017	—	.762	—	.0032	.0033
6.2	.700	.825	.0133	.0609	.0476	.31	.126	.227	.101	.0068	.0016	—	.756	—	.0032	.0032
7.0	.775	.900	.0133	.0653	.0520	.31	.118	.220	.102	.0068	.0016	—	.747	—	.0032	.0032
8.2	.885	1.015	.0135	.0601	.0466	.31	.108	.208	.100	.0067	.0015	—	.737	—	.0032	.0031
9.0	.950	1.085	.0143	.0706	.0563	.31	.100	.200	.100	.0067	.0014	—	.739	—	.0032	.0031

UPPER DUCT INLET

C_L	$\frac{V_n}{V_o}$	Engine air duct: $\frac{\Delta H}{q_o}$ Baffle	Engine air duct: $\frac{\Delta H}{q_o}$ Exit	Engine air duct: $\frac{\Delta P}{q_o}$	Engine air duct: $\frac{Q}{FV_o}$	Engine air duct: C_{D_i}	Left hand intercooler duct: $\frac{\Delta H}{q_o}$ Baffle	Left hand intercooler duct: $\frac{\Delta H}{q_o}$ Exit	Left hand intercooler duct: $\frac{\Delta P}{q_o}$	Left hand intercooler duct: $\frac{Q}{FV_o}$	Left hand intercooler duct: C_{D_i}	Cabin air duct: $\frac{\Delta H}{q_o}$ Baffle	Cabin air duct: $\frac{\Delta H}{q_o}$ Exit	Cabin air duct: $\frac{\Delta P}{q_o}$	Cabin air duct: $\frac{Q}{FV_o}$	Cabin air duct: C_{D_i}
0.535	0.37	0.104	0.386	0.282	0.0266	0.0115	0.044	0.058	0.014	0.0009	0.0001	—	0.066	—	0.0006	0.0000
.715	.37	.104	.386	.282	.0265	.0115	.039	.052	.013	.0010	.0001	—	.072	—	.0006	.0000
.825	.37	.104	.386	.282	.0265	.0116	.037	.052	.015	.0010	.0001	—	.072	—	.0006	.0000
.900	.37	.107	.389	.282	.0265	.0116	.037	.050	.013	.0010	.0001	—	.073	—	.0006	.0000
1.015	.37	.117	.400	.283	.0264	.0120	.037	.052	.015	.0010	.0001	—	.073	—	.0006	.0000
1.085	.37	.143	.426	.283	.0264	.0128	.042	.056	.014	.0010	.0001	—	.081	—	.0006	.0001

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TABLE 10.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{12}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 16x CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET											
							OIL-COOLER						LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0146	0.0638	0.0492	0.33	NOT MEASURED	0.254	–	0.0072	0.0020	–	0.773	–	0.0032	0.0034
5.0	.595	.715	.0145	.0641	.0496	.32		.235	–	.0071	.0018	–	.762	–	.0032	.0033
6.2	.700	.825	.0144	.0635	.0491	.32		.223	–	.0071	.0017	–	.753	–	.0032	.0033
7.0	.775	.900	.0144	.0694	.0550	.33		.215	–	.0071	.0016	–	.745	–	.0033	.0032
8.2	.885	1.015	.0146	.0724	.0578	.32		.202	–	.0070	.0015	–	.736	–	.0033	.0032
9.0	.950	1.085	.0152	.1001	.0849	.32		.192	–	.0070	.0014	–	.733	–	.0032	.0031

UPPER DUCT INLET																	
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.36	NOT MEASURED	0.425	–	0.0259	0.0126	NOT MEASURED	0.075	–	0.0009	0.0001	–	0.072	–	0.0005	0.0000
.715	.36		.425	–	.0259	.0126		.069	–	.0009	.0001	–	.077	–	.0005	.0000
.825	.36		.426	–	.0259	.0126		.068	–	.0009	.0001	–	.079	–	.0005	.0000
.900	.36		.427	–	.0261	.0217		.069	–	.0009	.0001	–	.077	–	.0005	.0000
1.015	.36		.437	–	.0259	.0130		.069	–	.0010	.0001	–	.079	–	.0006	.0000
1.085	.36		.457	–	.0260	.0137		.075	–	.0010	.0001	–	.085	–	.0006	.0000

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TABLE 11 .- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 17

CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
α	C_L		INTERNAL	TOTAL	EXTERNAL		$\frac{\Delta H}{q_o}$ BAFFLE	$\frac{\Delta H}{q_o}$ EXIT	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ BAFFLE	$\frac{\Delta H}{q_o}$ EXIT	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
3.0	0.415	0.535	0.0182	0.0650	0.0468	0.35	0.135	0.290	0.155	0.0078	0.0025	–	0.767	–	0.0034	0.0035
5.0	.596	.715	.0181	.0662	.0481	.35	.124	.276	.152	.0077	.0023	–	.749	–	.0034	.0034
6.2	.700	.825	.0179	.0654	.0475	.35	.115	.263	.148	.0076	.0022	–	.741	–	.0034	.0034
7.0	.775	.900	.0179	.0684	.0505	.34	.110	.253	.143	.0075	.0021	–	.735	–	.0034	.0033
8.2	.885	1.015	.0180	.0716	.0536	.34	.102	.239	.137	.0075	.0019	–	.723	–	.0034	.0032
9.0	.960	1.085	.0184	.0930	.0746	.34	.096	.230	.134	.0075	.0018	–	.719	–	.0034	.0032

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$ BAFFLE	$\frac{\Delta H}{q_o}$ EXIT	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ BAFFLE	$\frac{\Delta H}{q_o}$ EXIT	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ BAFFLE	$\frac{\Delta H}{q_o}$ EXIT	$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
0.535	0.40	0.131	0.478	0.347	0.0280	0.0155	0.055	0.090	0.035	0.0018	0.0002	–	0.092	–	0.0007	0.0001
.715	.40	.130	.481	.351	.0279	.0156	.050	.083	.033	.0018	.0002	–	.098	–	.0007	.0001
.825	.40	.128	.479	.351	.0280	.0155	.047	.083	.036	.0018	.0002	–	.098	–	.0007	.0001
.900	.40	.132	.479	.348	.0280	.0156	.049	.085	.036	.0018	.0002	–	.098	–	.0007	.0001
1.015	.40	.142	.488	.346	.0279	.0158	.049	.086	.037	.0018	.0002	–	.098	–	.0008	.0001
1.085	.40	.165	.503	.338	.0278	.0163	.054	.088	.034	.0019	.0002	–	.098	–	.0008	.0001

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TABLE 12.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 18 CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_Z	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0314	0.0758	0.0444	0.44	0.133	0.376	0.243	0.0097	0.0041	—	0.678	—	0.0043	0.0038
5.0	.595	.715	.0312	.0750	.0438	.43	.118	.356	.238	.0096	.0038	—	.675	—	.0042	.0036
6.2	.700	.825	.0313	.0754	.0441	.43	.110	.346	.236	.0095	.0036	—	.651	—	.0043	.0036
7.0	.775	.900	.0312	.0767	.0455	.43	.106	.337	.230	.0094	.0035	—	.643	—	.0043	.0035
8.2	.885	1.015	.0313	.0809	.0496	.42	.098	.323	.225	.0092	.0033	—	.632	—	.0043	.0034
9.0	.950	1.085	.0316	.0925	.0609	.42	.095	.316	.221	.0092	.0032	—	.627	—	.0043	.0034

UPPER DUCT INLET																
C_Z	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.47	0.162	0.677	0.515	0.0308	0.0266	0.063	0.159	0.096	0.0037	0.0006	—	0.099	—	0.0009	0.0001
.715	.47	.162	.678	.516	.0308	.0267	.057	.156	.099	.0037	.0006	—	.103	—	.0009	.0001
.825	.47	.162	.677	.515	.0313	.0270	.056	.156	.100	.0037	.0006	—	.103	—	.0009	.0001
.900	.47	.167	.679	.512	.0311	.0270	.058	.156	.098	.0037	.0006	—	.103	—	.0009	.0001
1.015	.47	.171	.685	.514	.0310	.0273	.059	.158	.099	.0037	.0006	—	.104	—	.0009	.0001
1.085	.47	.190	.696	.506	.0307	.0277	.063	.162	.099	.0037	.0006	—	.104	—	.0009	.0001

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TABLE 13.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 20 CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_Z	C_{D_I}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0353	0.0840	0.0487	0.50	0.140	0.482	0.342	0.0107	0.0060	—	0.519	—	0.0053	0.0033
5.0	.595	.715	.0348	.0797	.0449	.50	.132	.450	.318	.0106	.0055	—	.507	—	.0053	.0032
6.2	.700	.825	.0347	.0791	.0444	.50	.127	.437	.310	.0105	.0053	—	.497	—	.0053	.0031
7.0	.775	.900	.0350	.0808	.0458	.50	.125	.429	.304	.0105	.0051	—	.489	—	.0053	.0030
8.2	.885	1.015	.0355	.0811	.0456	.49	.117	.413	.296	.0103	.0048	—	.478	—	.0053	.0029
9.0	.950	1.085	.0355	.0895	.0540	.49	.112	.405	.293	.0102	.0047	—	.471	—	.0053	.0029

UPPER DUCT INLET																
C_L	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.49	0.145	0.694	0.549	0.0312	0.0279	0.079	0.273	0.194	0.0046	0.0014	—	0.120	—	0.0012	0.0001
.715	.49	.145	.696	.551	.0310	.0278	.077	.274	.197	.0047	.0014	—	.122	—	.0012	.0002
.825	.49	.146	.698	.552	.0309	.0278	.078	.277	.199	.0047	.0013	—	.126	—	.0012	.0002
.900	.49	.145	.700	.555	.0314	.0283	.075	.280	.205	.0047	.0014	—	.123	—	.0012	.0002
1.015	.49	.160	.708	.548	.0316	.0290	.090	.285	.195	.0047	.0015	—	.126	—	.0012	.0002
1.085	.49	.179	.719	.540	.0311	.0292	.088	.294	.206	.0048	.0015	—	.128	—	.0012	.0002

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TABLE 14.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 21 CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0488	0.0925	0.0437	0.64	0.164	0.599	0.435	0.0142	0.0104	—	0.448	—	0.0061	0.0031
5.0	.595	.715	.0481	.0896	.0415	.63	.156	.578	.417	.0140	.0097	—	.435	—	.0061	.0030
6.2	.700	.825	.0477	.0903	.0426	.62	.152	.555	.403	.0139	.0093	—	.428	—	.0060	.0029
7.0	.775	.900	.0473	.0879	.0406	.62	.148	.552	.404	.0137	.0091	—	.418	—	.0060	.0029
8.2	.885	1.015	.0469	.0901	.0432	.61	.142	.533	.391	.0135	.0086	—	.407	—	.0060	.0028
9.0	.950	1.085	.0466	.0950	.0484	.61	.136	.521	.385	.0134	.0083	—	.400	—	.0060	.0027

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.60	0.173	0.709	0.536	0.0376	0.0346	0.125	0.463	0.338	0.0067	0.0036	—	0.150	—	0.0013	0.0002
.715	.60	.171	.708	.537	.0376	.0345	.123	.465	.342	.0068	.0036	—	.152	—	.0013	.0002
.825	.61	.172	.705	.533	.0378	.0345	.125	.469	.344	.0068	.0037	—	.154	—	.0014	.0002
.900	.60	.173	.705	.532	.0376	.0343	.126	.468	.342	.0068	.0037	—	.154	—	.0014	.0002
1.015	.60	.181	.707	.526	.0376	.0344	.125	.469	.344	.0068	.0037	—	.157	—	.0014	.0002
1.085	.60	.205	.712	.507	.0372	.0344	.130	.473	.349	.0068	.0037	—	.160	—	.0014	.0002

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TABLE 15.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 22
CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
AIRPLANE		c_l	C_{D_I}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0485	0.0875	0.0390	0.50	0.164	0.599	0.435	0.0142	0.0104	–	0.807	–	0.0059	0.0067
5.0	.595	.715	.0478	.0847	.0369	.49	.156	.573	.417	.0140	.0097	–	.794	–	.0059	.0064
6.2	.700	.825	.0474	.0821	.0347	.49	.152	.555	.403	.0139	.0093	–	.785	–	.0059	.0063
7.0	.775	.900	.0470	.0858	.0388	.49	.148	.552	.404	.0137	.0091	–	.778	–	.0059	.0062
8.2	.885	1.015	.0466	.0888	.0422	.48	.142	.553	.391	.0135	.0086	–	.768	–	.0059	.0061
9.0	.950	1.085	.0462	.0924	.0462	.48	.136	.521	.385	.0134	.0083	–	.765	–	.0059	.0060

UPPER DUCT INLET																
c_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.65	0.173	0.709	0.536	0.0376	0.0346	0.108	0.303	0.195	0.0101	0.0033	–	0.150	–	0.0013	0.0002
.715	.65	.171	.708	.537	.0376	.0345	.107	.304	.197	.0101	.0034	–	.152	–	.0013	.0002
.825	.65	.172	.705	.533	.0378	.0345	.108	.306	.198	.0101	.0034	–	.154	–	.0014	.0002
.900	.65	.173	.705	.532	.0376	.0343	.108	.305	.197	.0101	.0034	–	.154	–	.0014	.0002
1.015	.65	.181	.707	.526	.0376	.0344	.109	.305	.196	.0102	.0034	–	.157	–	.0014	.0002
1.085	.64	.205	.712	.507	.0372	.0344	.112	.300	.188	.0102	.0033	–	.160	–	.0014	.0002

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TABLE 16.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 22x CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0485	0.0898	0.0413	0.64	0.164	0.599	0.435	0.0142	0.0104	—	0.448	—	0.0061	0.0031
5.0	.595	.715	.0478	.0889	.0411	.63	.156	.573	.417	.0140	.0097	—	.435	—	.0061	.0030
6.2	.700	.825	.0474	.0897	.0423	.62	.152	.555	.403	.0139	.0093	—	.428	—	.0060	.0029
7.0	.775	.900	.0470	.0886	.0416	.62	.148	.552	.404	.0137	.0091	—	.418	—	.0060	.0029
8.2	.885	1.015	.0466	.0898	.0432	.61	.142	.533	.391	.0135	.0086	—	.407	—	.0060	.0028
9.0	.950	1.085	.0462	.0879	.0417	.61	.136	.521	.385	.0134	.0083	—	.400	—	.0060	.0027

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.65	0.173	0.709	0.536	0.0376	0.0346	0.108	0.303	0.195	0.0101	0.0033	—	0.150	—	0.0013	0.0002
.715	.65	.171	.708	.537	.0376	.0345	.107	.304	.197	.0101	.0034	—	.152	—	.0013	.0002
.825	.65	.172	.705	.533	.0378	.0345	.108	.306	.198	.0101	.0034	—	.154	—	.0014	.0002
.900	.65	.173	.705	.532	.0376	.0343	.108	.305	.197	.0101	.0034	—	.154	—	.0014	.0002
1.015	.65	.181	.707	.526	.0376	.0344	.109	.305	.195	.0102	.0034	—	.157	—	.0014	.0002
1.085	.64	.205	.712	.507	.0372	.0344	.112	.300	.188	.0102	.0033	—	.160	—	.0014	.0002

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TABLE 17.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 22/24

CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_I}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0390	0.00907	0.0515	0.50	0.164	0.599	0.435	0.0142	0.0104	—	0.807	—	0.0059	0.0067
5.0	.595	.715	.0385	.0878	.0499	.49	.156	.573	.417	.0140	.0097	—	.794	—	.0059	.0064
6.2	.700	.825	.0382	.0879	.0495	.49	.152	.555	.403	.0139	.0093	—	.785	—	.0059	.0063
7.0	.775	.900	.0381	.0889	.0506	.49	.148	.552	.404	.0137	.0091	—	.778	—	.0059	.0062
8.2	.885	1.015	.0380	.0939	.0556	.48	.142	.533	.391	.0135	.0086	—	.768	—	.0059	.0061
9.0	.950	1.085	.0381	.1007	.0626	.48	.136	.521	.385	.0134	.0083	—	.765	—	.0059	.0060

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.59	0.304	0.544	0.240	0.0436	0.0283	—	—	—	0	—	—	0.150	—	0.0013	0.0002
.715	.59	.307	.547	.240	.0436	.0285	—	—	—	0	—	—	.152	—	.0013	.0002
.825	.59	.308	.549	.241	.0437	.0287	—	—	—	0	—	—	.154	—	.0014	.0002
.900	.59	.309	.551	.242	.0437	.0288	—	—	—	0	—	—	.154	—	.0014	.0002
1.015	.59	.317	.558	.241	.0435	.0292	—	—	—	0	—	—	.157	—	.0014	.0002
1.085	.59	.334	.567	.233	.0432	.0296	—	—	—	0	—	—	.160	—	.0014	.0002

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TABLE 18.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 23x CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0220	0.0678	0.0458	0.45	0.110	0.328	0.218	0.0104	0.0038	—	0.703	—	0.0075	0.0068
5.0	.595	.715	.0217	.0687	.0470	.45	.092	.310	.218	.0103	.0035	—	.687	—	.0076	.0067
6.2	.700	.825	.0215	.0686	.0471	.44	.084	.303	.219	.0102	.0034	—	.683	—	.0075	.0065
7.0	.775	.900	.0214	.0650	.0436	.44	.078	.294	.216	.0101	.0032	—	.672	—	.0075	.0064
8.2	.885	1.015	.0212	.0707	.0495	.43	.069	.281	.212	.0099	.0030	—	.664	—	.0075	.0063
9.0	.950	1.085	.0214	.0749	.0535	.44	.065	.279	.214	.0098	.0030	—	.652	—	.0077	.0063

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.46	0.131	0.521	0.390	0.0284	0.0175	0.060	0.124	0.064	0.0055	0.0007	—	0.090	—	0.0007	0.0001
.715	.46	.131	.518	.387	.0284	.0174	.057	.123	.066	.0056	.0007	—	.095	—	.0007	.0001
.825	.46	.131	.517	.386	.0284	.0173	.058	.124	.066	.0056	.0007	—	.092	—	.0007	.0001
.900	.46	.131	.517	.386	.0284	.0173	.060	.126	.066	.0057	.0007	—	.094	—	.0007	.0001
1.015	.46	.143	.520	.377	.0282	.0174	.061	.128	.067	.0057	.0007	—	.094	—	.0007	.0001
1.085	.45	.163	.530	.367	.0278	.0175	.068	.133	.065	.0057	.0007	—	.097	—	.0007	.0001

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TABLE 19.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 24

CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET											
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					ENGINE CHARGE-AIR DUCTS					
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT				
3.0	0.415	0.535	0.0678	0.1300	0.0622	0.72	0.213	0.890	0.677	0.0174	0.0233	—	0.480	—	0.0114	0.0064	
5.0	.595	.715	.0666	.1285	.0619	.71	.200	.869	.669	.0172	.0220	—	.455	—	.0114	.0060	
6.2	.700	.825	.0659	.1253	.0594	.71	.191	.855	.664	.0171	.0212	—	.448	—	.0114	.0058	
7.0	.775	.900	.0652	.1246	.0594	.70	.185	.844	.659	.0170	.0206	—	.444	—	.0113	.0058	
8.2	.885	1.015	.0641	.1249	.0608	.70	.178	.824	.646	.0167	.0194	—	.437	—	.0113	.0056	
9.0	.950	1.085	.0633	.1276	.0643	.69	.172	.811	.639	.0165	.0187	—	.434	—	.0112	.0056	

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.83	0.304	0.544	0.240	0.0436	0.0283	0.189	0.694	0.505	0.0178	0.0159	—	0.196	—	0.0015	0.0003
.715	.83	.307	.547	.240	.0436	.0285	.189	.691	.502	.0177	.0157	—	.195	—	.0015	.0003
.825	.83	.308	.549	.241	.0437	.0287	.189	.689	.500	.0177	.0157	—	.196	—	.0015	.0003
.900	.83	.309	.551	.242	.0437	.0288	.189	.685	.496	.0176	.0155	—	.199	—	.0015	.0003
1.015	.82	.317	.558	.241	.0435	.0292	.188	.678	.490	.0175	.0151	—	.204	—	.0015	.0003
1.085	.82	.334	.567	.233	.0432	.0296	.189	.669	.480	.0173	.0147	—	.206	—	.0015	.0003

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TABLE 20.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 24x CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		c_l	C_{D_I}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0694	0.1248	0.0554	0.70	NOT MEASURED	0.918	—	0.0165	0.0235	—	0.514	—	0.0117	0.0071
5.0	.595	.715	.0667	.1194	.0527	.71		.848	—	.0170	.0206	—	.497	—	.0116	.0067
6.2	.700	.825	.0661	.1166	.0505	.71		.833	—	.0169	.0200	—	.487	—	.0115	.0065
7.0	.775	.900	.0658	.1134	.0476	.70		.821	—	.0168	.0194	—	.479	—	.0114	.0063
8.2	.885	1.015	.0651	.1147	.0496	.69		.801	—	.0166	.0183	—	.470	—	.0113	.0061
9.0	.950	1.085	.0648	.1184	.0536	.69		.786	—	.0165	.0177	—	.462	—	.0113	.0060

UPPER DUCT INLET																
c_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.90	NOT MEASURED	0.562	—	0.0503	0.0341	NOT MEASURED	0.579	—	0.0163	0.0114	—	0.214	—	0.0015	0.0003
.715	.90		.561	—	.0502	.0339		.589	—	.0162	.0116	—	.212	—	.0015	.0003
.825	.90		.558	—	.0504	.0339		.597	—	.0163	.0119	—	.213	—	.0015	.0003
.900	.90		.560	—	.0504	.0340		.606	—	.0163	.0121	—	.215	—	.0015	.0003
1.015	.90		.564	—	.0500	.0341		.606	—	.0164	.0122	—	.216	—	.0015	.0003
1.085	.89		.572	—	.0498	.0342		.615	—	.0165	.0125	—	.221	—	.0015	.0004

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TABLE 21.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 24y CONFIGURATION 2.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
AIRPLANE		C_z	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0619	0.1072	0.0453	0.72	NOT MEASURED	0.713	—	0.0173	0.0161	—	0.514	—	0.0117	0.0071
5.0	.595	.715	.0610	.1013	.0403	.71		.688	—	.0171	.0151	—	.497	—	.0116	.0067
6.2	.700	.825	.0605	.1023	.0418	.71		.670	—	.0170	.0145	—	.487	—	.0115	.0065
7.0	.775	.900	.0604	.1007	.0403	.70		.658	—	.0168	.0140	—	.479	—	.0114	.0063
8.2	.885	1.015	.0599	.1054	.0455	.69		.638	—	.0166	.0133	—	.470	—	.0113	.0061
9.0	.950	1.085	.0598	.1074	.0476	.69		.625	—	.0164	.0128	—	.462	—	.0113	.0060

UPPER DUCT INLET																
C_L	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.90	NOT MEASURED	0.562	—	0.0503	0.0341	NOT MEASURED	0.579	—	0.0163	0.0114	—	0.214	—	0.0015	0.0003
.715	.90		.561	—	.0502	.0339		.589	—	.0162	.0116	—	.212	—	.0015	.0003
.825	.90		.558	—	.0504	.0339		.597	—	.0163	.0119	—	.213	—	.0015	.0003
.900	.90		.560	—	.0504	.0340		.605	—	.0163	.0121	—	.215	—	.0015	.0003
1.015	.90		.564	—	.0500	.0341		.606	—	.0164	.0122	—	.216	—	.0015	.0003
1.085	.89		.572	—	.0493	.0342		.615	—	.0165	.0125	—	.221	—	.0015	.0003

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TABLE 22.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 1

CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535				0.17	—	0.063	—	0.0032	—	—	0.277	—	0.0021	—
5.0	.595	.715				.17	—	.034	—	.0032	—	—	.209	—	.0022	—
6.2	.700	.825				.17	—	.028	—	.0032	—	—	.192	—	.0022	—
7.0	.775	.900				.17	—	.026	—	.0032	—	—	.191	—	.0022	—
8.2	.885	1.015				.17	—	.024	—	.0032	—	—	.193	—	.0022	—
9.0	.960	1.085				.17	—	.023	—	.0031	—	—	.191	—	.0022	—

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.30	—	0.068	—	0.0215	—	—	0.021	—	0.0014	—	—	—	—	0	—
.715	.30	—	.069	—	.0214	—	—	.020	—	.0014	—	—	—	—	0	—
.825	.30	—	.073	—	.0213	—	—	.021	—	.0015	—	—	—	—	0	—
.900	.30	—	.083	—	.0212	—	—	.023	—	.0015	—	—	—	—	0	—
1.015	.30	—	.110	—	.0210	—	—	.057	—	.0015	—	—	—	—	0	—
1.085	.29	—	.138	—	.0208	—	—	.094	—	.0015	—	—	—	—	0	—

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TABLE 23.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 2 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535				0.33	—	0.079	—	0.0073	—	—	0.263	—	0.0031	—
5.0	.595	.715				.32	—	.059	—	.0072	—	—	.256	—	.0030	—
6.2	.700	.825				.32	—	.056	—	.0072	—	—	.252	—	.0030	—
7.0	.775	.900				.32	—	.055	—	.0071	—	—	.251	—	.0030	—
8.2	.885	1.015				.31	—	.056	—	.0070	—	—	.250	—	.0030	—
9.0	.950	1.085				.31	—	.057	—	.0070	—	—	.252	—	.0030	—

C_l	$\frac{V_n}{V_o}$	UPPER DUCT INLET														
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.38	—	0.107	—	0.0273	—	—	0.021	—	0.0010	—	—	0.073	—	0.0006	—
.715	.38	—	.109	—	.0273	—	—	.021	—	.0010	—	—	.076	—	.0006	—
.825	.38	—	.110	—	.0273	—	—	.022	—	.0010	—	—	.078	—	.0006	—
.900	.38	—	.118	—	.0270	—	—	.023	—	.0010	—	—	.083	—	.0006	—
1.015	.37	—	.149	—	.0267	—	—	.041	—	.0011	—	—	.103	—	.0006	—
1.085	.37	—	.179	—	.0264	—	—	.089	—	.0010	—	—	.133	—	.0006	—

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TABLE 24.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 3 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_L	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535				0.45	—	0.104	—	0.0096	—	—	0.543	—	0.0047	—
5.0	.595	.715				.44	—	.100	—	.0095	—	—	.543	—	.0046	—
6.2	.700	.825				.44	—	.099	—	.0094	—	—	.539	—	.0046	—
7.0	.775	.900				.44	—	.098	—	.0093	—	—	.537	—	.0046	—
8.2	.885	1.015				.43	—	.100	—	.0092	—	—	.545	—	.0045	—
9.0	.950	1.085				.42	—	.104	—	.0091	—	—	.547	—	.0044	—

UPPER DUCT INLET																
C_L	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.49	—	0.146	—	0.0331	—	—	0.067	—	0.0035	—	—	0.131	—	0.0009	—
.715	.50	—	.147	—	.0331	—	—	.062	—	.0036	—	—	.144	—	.0009	—
.825	.50	—	.148	—	.0332	—	—	.061	—	.0036	—	—	.147	—	.0009	—
.900	.50	—	.145	—	.0332	—	—	.061	—	.0036	—	—	.151	—	.0009	—
1.015	.49	—	.166	—	.0326	—	—	.068	—	.0036	—	—	.141	—	.0009	—
1.085	.48	—	.190	—	.0321	—	—	.083	—	.0036	—	—	.141	—	.0009	—

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TABLE 25.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 4 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535				0.61	—	0.149	—	0.0134	—	—	0.557	—	0.0060	—
5.0	.595	.715				.60	—	.146	—	.0132	—	—	.550	—	.0060	—
6.2	.700	.825				.59	—	.141	—	.0131	—	—	.544	—	.0059	—
7.0	.775	.900				.59	—	.141	—	.0130	—	—	.540	—	.0059	—
8.2	.885	1.015				.58	—	.145	—	.0128	—	—	.536	—	.0058	—
9.0	.950	1.085				.58	—	.149	—	.0127	—	—	.535	—	.0058	—

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.64	—	0.199	—	0.0402	—	—	0.119	—	0.0068	—	—	0.216	—	0.0014	—
.715	.64	—	.200	—	.0402	—	—	.117	—	.0068	—	—	.221	—	.0014	—
.825	.64	—	.200	—	.0402	—	—	.118	—	.0068	—	—	.221	—	.0015	—
.900	.64	—	.198	—	.0403	—	—	.117	—	.0068	—	—	.229	—	.0016	—
1.015	.63	—	.213	—	.0395	—	—	.118	—	.0068	—	—	.227	—	.0015	—
1.085	.63	—	.236	—	.0392	—	—	.125	—	.0067	—	—	.237	—	.0015	—

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TABLE 26.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 5 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE			C_{D_i}	C_{D_F}	C_{D_p}		OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
						$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L	C_l	INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535				0.89	—	0.174	—	0.0177	—	—	0.667	—	0.0106	—
5.0	.595	.715				.87	—	.175	—	.0174	—	—	.656	—	.0105	—
6.2	.700	.825				.87	—	.187	—	.0171	—	—	.644	—	.0106	—
7.0	.775	.900				.86	—	.198	—	.0169	—	—	.637	—	.0106	—
8.2	.885	1.015				.85	—	.204	—	.0166	—	—	.630	—	.0104	—
9.0	.950	1.085				.84	—	.217	—	.0164	—	—	.622	—	.0105	—

UPPER DUCT INLET																
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.75	—	0.311	—	0.0473	—	—	0.167	—	0.0084	—	—	0.223	—	0.0014	—
.715	.75	—	.310	—	.0471	—	—	.167	—	.0084	—	—	.221	—	.0014	—
.825	.75	—	.301	—	.0475	—	—	.170	—	.0084	—	—	.220	—	.0015	—
.900	.75	—	.310	—	.0468	—	—	.171	—	.0084	—	—	.226	—	.0015	—
1.015	.75	—	.316	—	.0469	—	—	.171	—	.0083	—	—	.225	—	.0015	—
1.085	.74	—	.331	—	.0465	—	—	.174	—	.0083	—	—	.225	—	.0015	—

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TABLE 27.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 6 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
		C_Z	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535				0.17	—	0.062	—	0.0033	—	—	0.278	—	0.0022	—
5.0	.595	.715				.17	—	.035	—	.0033	—	—	.211	—	.0022	—
6.2	.700	.825				.17	—	.028	—	.0032	—	—	.194	—	.0022	—
7.0	.775	.900				.17	—	.027	—	.0032	—	—	.191	—	.0022	—
8.2	.885	1.015				.17	—	.025	—	.0032	—	—	.191	—	.0022	—
9.0	.950	1.085				.17	—	.024	—	.0032	—	—	.189	—	.0022	—

UPPER DUCT INLET																
		ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
C_L	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.32	—	0.068	—	0.0214	—	—	0.032	—	0.0026	—	—	—	—	0	—
.715	.32	—	.070	—	.0213	—	—	.030	—	.0027	—	—	—	—	0	—
.825	.32	—	.071	—	.0213	—	—	.030	—	.0027	—	—	—	—	0	—
.900	.32	—	.080	—	.0212	—	—	.030	—	.0027	—	—	—	—	0	—
1.015	.31	—	.110	—	.0208	—	—	.056	—	.0027	—	—	—	—	0	—
1.085	.31	—	.139	—	.0205	—	—	.094	—	.0027	—	—	—	—	0	—

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TABLE 28.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 7 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.416	0.535				0.90	—	0.174	—	0.0179	—	—	0.674	—	0.0108	—
5.0	.595	.715				.89	—	.180	—	.0176	—	—	.665	—	.0107	—
6.2	.700	.825				.87	—	.192	—	.0173	—	—	.651	—	.0106	—
7.0	.775	.900				.86	—	.201	—	.0170	—	—	.647	—	.0106	—
8.2	.885	1.015				.86	—	.205	—	.0169	—	—	.632	—	.0106	—
9.0	.950	1.085				.86	—	.219	—	.0166	—	—	.629	—	.0107	—

UPPER DUCT INLET																
		ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.84	—	0.287	—	0.0459	—	—	.185	—	0.0161	—	—	0.237	—	0.0014	—
.715	.83	—	.286	—	.0457	—	—	.186	—	.0162	—	—	.236	—	.0014	—
.825	.83	—	.288	—	.0457	—	—	.187	—	.0162	—	—	.238	—	.0014	—
.900	.83	—	.286	—	.0455	—	—	.186	—	.0162	—	—	.245	—	.0014	—
1.015	.83	—	.291	—	.0452	—	—	.188	—	.0161	—	—	.253	—	.0014	—
1.085	.82	—	.301	—	.0449	—	—	.190	—	.0161	—	—	.249	—	.0014	—

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TABLE 23.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 8 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_I}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0052	0.0463	0.0411	0.17	0.056	0.091	0.035	0.0033	0.0003	—	0.301	—	0.0021	0.0007
5.0	.595	.715	.0052	.0408	.0356	.17	.036	.059	.023	.0033	.0002	—	.222	—	.0022	.0005
6.2	.700	.825	.0052	.0474	.0422	.17	.029	.050	.021	.0032	.0002	—	.207	—	.0022	.0005
7.0	.775	.900	.0053	.0582	.0529	.17	.028	.047	.019	.0032	.0002	—	.203	—	.0022	.0005
8.2	.885	1.015	.0057	.0735	.0678	.17	.027	.046	.019	.0032	.0002	—	.200	—	.0022	.0005
9.0	.950	1.085	.0062	.0909	.0847	.17	.027	.045	.018	.0032	.0001	—	.199	—	.0022	.0005

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.28	0.071	0.233	0.162	0.0199	0.0048	0.020	0.050	0.030	0.0012	0.0001	—	—	—	0	—
.715	.28	.072	.229	.157	.0198	.0049	.020	.047	.027	.0012	.0001	—	—	—	0	—
.825	.28	.077	.230	.153	.0199	.0049	.020	.050	.030	.0013	.0001	—	—	—	0	—
.900	.28	.087	.236	.149	.0198	.0050	.023	.049	.026	.0013	.0001	—	—	—	0	—
1.015	.27	.116	.260	.144	.0195	.0054	.062	.077	.015	.0013	.0001	—	—	—	0	—
1.085	.27	.145	.284	.139	.0194	.0060	.098	.112	.014	.0013	.0001	—	—	—	0	—

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TABLE 30.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 9
CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0126	0.0483	0.0357	0.32	0.074	0.167	0.093	0.0071	0.0012	—	0.268	—	0.0030	0.0009
5.0	.595	.715	.0124	.0522	.0398	.32	.051	.147	.096	.0071	.0011	—	.260	—	.0030	.0008
6.2	.700	.825	.0125	.0500	.0375	.31	.046	.145	.099	.0070	.0011	—	.260	—	.0030	.0008
7.0	.775	.900	.0128	.0601	.0473	.31	.047	.143	.096	.0070	.0010	—	.259	—	.0030	.0008
8.2	.885	1.015	.0135	.0664	.0529	.31	.049	.139	.090	.0069	.0010	—	.263	—	.0030	.0008
9.0	.950	1.085	.0142	.0885	.0743	.30	.051	.143	.092	.0068	.0010	—	.265	—	.0029	.0008

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.35	0.098	0.400	0.302	0.0249	0.0112	0.015	0.028	0.013	0.0010	0.0000	—	0.068	—	0.0006	0.0000
.715	.35	.099	.400	.301	.0250	.0113	.015	.027	.012	.0010	.0000	—	.072	—	.0006	.0000
.825	.35	.098	.403	.306	.0250	.0114	.015	.028	.013	.0011	.0000	—	.074	—	.0006	.0000
.900	.35	.108	.415	.307	.0248	.0116	.016	.032	.016	.0011	.0000	—	.083	—	.0006	.0001
1.015	.34	.136	.443	.307	.0244	.0124	.033	.069	.036	.0011	.0001	—	.111	—	.0006	.0001
1.085	.34	.164	.468	.304	.0240	.0130	.076	.115	.039	.0010	.0001	—	.148	—	.0006	.0001

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TABLE 31.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;

RUN 10 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0125	0.0475	0.0350	0.31	0.074	0.167	0.093	0.0068	0.0012	——	0.267	——	0.0030	0.0009
5.0	.595	.715	.0124	.0464	.0340	.31	.051	.147	.096	.0068	.0010	——	.255	——	.0030	.0008
6.2	.700	.825	.0125	.0501	.0376	.30	.046	.145	.099	.0067	.0010	——	.256	——	.0030	.0008
7.0	.775	.900	.0127	.0620	.0493	.30	.047	.144	.097	.0067	.0010	——	.255	——	.0030	.0008
8.2	.885	1.015	.0135	.0721	.0586	.30	.049	.141	.092	.0066	.0010	——	.255	——	.0029	.0008
9.0	.950	1.085	.0141	.0885	.0744	.30	.051	.140	.089	.0066	.0010	——	.259	——	.0029	.0008

UPPER DUCT INLET																
C_L	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.35	0.098	0.400	0.302	0.0249	0.0112	0.015	0.028	0.013	0.0010	0.0000	——	0.068	——	0.0006	0.0000
.715	.35	.099	.400	.301	.0250	.0113	.015	.027	.012	.0010	.0000	——	.072	——	.0006	.0000
.825	.35	.098	.403	.305	.0250	.0114	.015	.028	.013	.0011	.0000	——	.074	——	.0006	.0000
.900	.35	.108	.416	.307	.0248	.0116	.016	.032	.016	.0011	.0000	——	.083	——	.0006	.0001
1.015	.34	.136	.443	.307	.0244	.0124	.033	.069	.036	.0011	.0001	——	.111	——	.0006	.0001
1.085	.34	.164	.468	.304	.0240	.0130	.076	.115	.039	.0010	.0001	——	.148	——	.0006	.0001

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TABLE 32.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 13 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0168	0.0462	0.0294	0.35	0.078	0.198	0.120	0.0072	0.0015	——	0.407	——	0.0040	0.0018
5.0	.595	.715	.0166	.0478	.0312	.35	.065	.194	.130	.0071	.0015	——	.405	——	.0040	.0018
6.2	.700	.825	.0164	.0617	.0353	.34	.064	.183	.129	.0071	.0014	——	.403	——	.0039	.0018
7.0	.775	.900	.0166	.0540	.0374	.34	.064	.180	.126	.0071	.0013	——	.402	——	.0039	.0018
8.2	.885	1.015	.0173	.0652	.0479	.34	.064	.178	.124	.0070	.0013	——	.405	——	.0039	.0018
9.0	.950	1.085	.0180	.0832	.0652	.34	.068	.176	.117	.0069	.0013	——	.415	——	.0038	.0018

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.42	0.083	0.465	0.372	0.0287	0.0150	0.024	0.070	0.046	0.0021	0.0002	——	0.103	——	0.0007	0.0001
.715	.42	.085	.466	.371	.0286	.0150	.022	.065	.043	.0021	.0001	——	.099	——	.0007	.0001
.825	.42	.085	.447	.362	.0291	.0149	.024	.065	.041	.0021	.0002	——	.099	——	.0007	.0001
.900	.42	.094	.453	.359	.0289	.0150	.024	.067	.043	.0022	.0002	——	.105	——	.0007	.0001
1.015	.41	.123	.476	.353	.0284	.0157	.040	.079	.039	.0022	.0002	——	.119	——	.0008	.0001
1.085	.41	.152	.496	.344	.0282	.0164	.085	.101	.016	.0022	.0002	——	.131	——	.0008	.0001

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TABLE 33.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 14
CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.416	0.535	0.0326	0.0658	0.0332	0.46	0.108	0.313	0.205	0.0099	0.0034	–	0.560	–	0.0047	0.0031
5.0	.595	.715	.0326	.0585	.0259	.45	.103	.303	.200	.0098	.0032	–	.553	–	.0045	.0030
6.2	.700	.825	.0324	.0576	.0252	.44	.098	.301	.203	.0097	.0032	–	.547	–	.0045	.0029
7.0	.775	.900	.0325	.0601	.0276	.44	.097	.292	.195	.0096	.0030	–	.528	–	.0046	.0029
8.2	.885	1.015	.0327	.0731	.0404	.43	.095	.288	.193	.0095	.0030	–	.555	–	.0043	.0029
9.0	.950	1.085	.0329	.0773	.0444	.43	.092	.287	.195	.0094	.0029	–	.555	–	.0043	.0029

UPPER DUCT INLET																
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		NO BAFFLE	BAFFLE				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.50	0.148	0.668	0.520	0.0337	0.0285	0.062	0.159	0.097	0.0033	0.0006	–	0.133	–	0.0008	0.0001
.715	.60	.149	.670	.521	.0338	.0287	.060	.157	.097	.0034	.0006	–	.135	–	.0009	.0001
.825	.50	.148	.668	.520	.0337	.0285	.060	.155	.095	.0034	.0005	–	.142	–	.0009	.0001
.900	.50	.158	.669	.511	.0339	.0287	.060	.157	.097	.0034	.0006	–	.148	–	.0009	.0001
1.015	.50	.173	.680	.507	.0334	.0290	.068	.165	.097	.0034	.0006	–	.135	–	.0009	.0001
1.085	.49	.198	.696	.498	.0326	.0293	.084	.174	.090	.0034	.0006	–	.139	–	.0009	.0001

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TABLE 34.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 15 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0326	0.0667	0.0341	0.46	0.102	0.325	0.223	0.0094	0.0034	—	0.563	—	0.0049	0.0033
5.0	.595	.715	.0325	.0596	.0271	.44	.093	.311	.218	.0093	.0032	—	.547	—	.0049	.0032
6.2	.700	.825	.0323	.0640	.0316	.44	.093	.308	.215	.0093	.0032	—	.537	—	.0049	.0031
7.0	.775	.900	.0325	.0621	.0296	.44	.091	.302	.211	.0092	.0030	—	.538	—	.0048	.0031
8.2	.885	1.015	.0327	.0658	.0331	.43	.088	.297	.209	.0090	.0029	—	.537	—	.0047	.0030
9.0	.950	1.085	.0329	.0755	.0426	.43	.085	.299	.214	.0089	.0029	—	.535	—	.0047	.0030

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		NO BAFFLE	BAFFLE				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.50	0.148	0.668	0.520	0.0337	0.0286	0.062	0.159	0.097	0.0033	0.0006	—	0.133	—	0.0008	0.0001
.715	.50	.149	.670	.521	.0338	.0286	.060	.157	.097	.0034	.0006	—	.135	—	.0009	.0001
.825	.50	.148	.668	.520	.0337	.0285	.060	.155	.095	.0034	.0005	—	.142	—	.0009	.0001
.900	.50	.158	.669	.511	.0339	.0287	.060	.157	.097	.0034	.0006	—	.148	—	.0009	.0001
1.015	.50	.173	.680	.507	.0334	.0290	.068	.165	.097	.0034	.0006	—	.136	—	.0009	.0001
1.085	.48	.198	.696	.498	.0326	.0293	.084	.174	.090	.0034	.0006	—	.139	—	.0009	.0001

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TABLE 35.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 17 CONFIGURATION 8.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0337	0.0728	0.0391	0.54	0.132	0.424	0.292	0.0118	0.0057	—	0.568	—	0.0055	0.0038
5.0	.595	.715	.0336	.0640	.0304	.54	.122	.411	.289	.0116	.0054	—	.558	—	.0055	.0037
6.2	.700	.825	.0346	.0654	.0308	.53	.125	.408	.280	.0115	.0053	—	.555	—	.0054	.0036
7.0	.775	.900	.0336	.0685	.0349	.53	.120	.401	.281	.0114	.0053	—	.551	—	.0054	.0036
8.2	.885	1.015	.0341	.0737	.0396	.52	.121	.395	.274	.0113	.0050	—	.546	—	.0053	.0035
9.0	.950	1.085	.0347	.0909	.0562	.52	.123	.397	.274	.0112	.0050	—	.543	—	.0053	.0035

UPPER DUCT INLET																
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		NO BAFFLE	BAFFLE				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.47	0.126	0.684	0.558	0.0304	0.0266	0.075	0.269	0.194	0.0043	0.0012	—	0.169	—	0.0011	0.0002
.715	.47	.126	.685	.559	.0304	.0267	.074	.267	.193	.0043	.0012	—	.169	—	.0011	.0002
.825	.47	.127	.688	.561	.0304	.0269	.075	.269	.194	.0044	.0013	—	.167	—	.0011	.0002
.900	.47	.136	.694	.558	.0299	.0267	.075	.272	.197	.0044	.0013	—	.167	—	.0012	.0002
1.015	.47	.153	.710	.557	.0298	.0275	.077	.278	.201	.0044	.0013	—	.163	—	.0012	.0002
1.085	.46	.182	.729	.547	.0294	.0281	.088	.292	.204	.0045	.0014	—	.165	—	.0012	.0002

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TABLE 36.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 18 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0462	0.0689	0.0227	0.60	0.093	0.509	0.416	0.0137	0.0082	—	0.625	—	0.0054	0.0042
5.0	.595	.715	.0454	.0664	.0210	.59	.091	.493	.402	.0135	.0078	—	.608	—	.0054	.0040
6.2	.700	.825	.0470	.0632	.0162	.59	.089	.490	.401	.0134	.0077	—	.613	—	.0053	.0040
7.0	.775	.900	.0461	.0697	.0236	.58	.089	.482	.393	.0131	.0073	—	.608	—	.0053	.0040
8.2	.885	1.015	.0463	.0716	.0253	.57	.097	.479	.382	.0130	.0072	—	.602	—	.0053	.0039
9.0	.950	1.085	.0457	.0753	.0296	.57	.102	.484	.382	.0129	.0073	—	.602	—	.0052	.0039

UPPER DUCT INLET																
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.57	0.159	0.730	0.571	0.0365	0.0341	0.132	0.480	0.348	0.0065	0.0036	—	0.153	—	0.0014	0.0002
.715	.58	.158	.720	.562	.0358	.0337	.132	.486	.354	.0066	.0037	—	.160	—	.0014	.0002
.825	.60	.160	.724	.564	.0371	.0352	.133	.500	.367	.0067	.0039	—	.178	—	.0015	.0003
.900	.59	.161	.723	.562	.0365	.0345	.137	.508	.371	.0068	.0040	—	.174	—	.0015	.0003
1.015	.59	.179	.730	.551	.0361	.0347	.144	.513	.369	.0068	.0041	—	.181	—	.0015	.0003
1.085	.56	.197	.741	.544	.0346	.0340	.151	.526	.375	.0067	.0042	—	.196	—	.0015	.0003

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TABLE 37.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{12}$-SCALE MODEL OF XB-36 INBOARD NACELLE;

RUN 18a CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_I}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0452	0.0638	0.0186	0.58	NOT MEASURED	0.516	——	0.0138	0.0084	——	0.677	——	0.0048	0.0042
5.0	.595	.715	.0447	.0612	.0165	.57		.500	——	.0136	.0080	——	.675	——	.0047	.0040
6.2	.700	.825	.0448	.0683	.0235	.57		.495	——	.0135	.0078	——	.671	——	.0047	.0040
7.0	.775	.900	.0446	.0749	.0303	.56		.492	——	.0133	.0077	——	.664	——	.0047	.0039
8.2	.885	1.015	.0452	.0816	.0364	.56		.488	——	.0132	.0075	——	.660	——	.0046	.0038
9.0	.950	1.085	.0444	.0904	.0460	.56		.483	——	.0131	.0074	——	.656	——	.0046	.0038

UPPER DUCT INLET																
		ENGINE AIR DUCT					LEFT HAND INTERCOOLER DUCT					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_I}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.57	NOT MEASURED	0.715	——	0.0351	0.0326	NOT MEASURED	0.479	——	0.0068	0.0038	——	0.150	——	0.0014	0.0002
.715	.57		.712	——	.0352	.0325		.491	——	.0069	.0040	——	.154	——	.0014	.0002
.825	.58		.710	——	.0356	.0326		.502	——	.0070	.0041	——	.154	——	.0015	.0002
.900	.58		.710	——	.0363	.0325		.506	——	.0070	.0042	——	.154	——	.0015	.0002
1.015	.59		.712	——	.0360	.0333		.510	——	.0070	.0042	——	.161	——	.0015	.0003
1.085	.57		.716	——	.0349	.0325		.514	——	.0070	.0043	——	.168	——	.0015	.0003

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TABLE 38.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;

RUN 19 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0449	0.0654	0.0205	0.59	0.126	0.523	0.397	0.0137	0.0085	—	0.633	—	0.0052	0.0041
5.0	.595	.715	.0446	.0707	.0261	.59	.122	.507	.385	.0135	.0080	—	.621	—	.0052	.0040
6.2	.700	.825	.0438	.0629	.0191	.58	.121	.500	.379	.0134	.0078	—	.616	—	.0051	.0039
7.0	.775	.900	.0439	.0719	.0280	.58	.125	.493	.368	.0133	.0076	—	.615	—	.0051	.0038
8.2	.885	1.015	.0443	.0853	.0410	.56	.134	.492	.358	.0130	.0075	—	.609	—	.0050	.0038
9.0	.950	1.085	.0444	.0917	.0473	.56	.138	.491	.353	.0129	.0074	—	.610	—	.0050	.0038

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.64	0.159	0.695	0.536	0.0378	0.0338	0.088	0.276	0.188	0.0093	0.0028	—	0.201	—	0.0014	0.0003
.715	.63	.159	.698	.539	.0371	.0334	.090	.280	.190	.0094	.0028	—	.202	—	.0014	.0003
.825	.62	.161	.698	.537	.0364	.0328	.091	.286	.195	.0094	.0029	—	.205	—	.0014	.0003
.900	.63	.163	.695	.532	.0369	.0330	.090	.287	.197	.0095	.0030	—	.207	—	.0014	.0003
1.015	.63	.182	.700	.518	.0370	.0334	.094	.292	.198	.0096	.0030	—	.209	—	.0014	.0003
1.085	.63	.203	.710	.507	.0364	.0335	.100	.297	.197	.0096	.0031	—	.214	—	.0015	.0003

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TABLE 39.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;

RUN 20 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		BAFFLE	EXIT				BAFFLE	EXIT			
3.0	0.415	0.535	0.0393	0.0777	0.0384	0.62	0.118	0.538	0.420	0.0140	0.0090	—	0.592	—	0.0057	0.0041
5.0	.595	.715	.0398	.0774	.0376	.61	.116	.523	.407	.0138	.0086	—	.582	—	.0056	.0039
6.2	.700	.825	.0402	.0763	.0351	.60	.114	.515	.401	.0137	.0083	—	.573	—	.0056	.0038
7.0	.775	.900	.0405	.0795	.0390	.60	.112	.508	.396	.0136	.0081	—	.569	—	.0056	.0038
8.2	.885	1.015	.0412	.0896	.0484	.59	.129	.506	.377	.0134	.0080	—	.564	—	.0056	.0038
9.0	.960	1.085	.0419	.0949	.0530	.59	.136	.506	.370	.0132	.0079	—	.560	—	.0055	.0037

UPPER DUCT INLET																
		ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				BAFFLE	EXIT				BAFFLE	EXIT			
0.535	0.58	0.088	0.363	0.275	0.0265	0.0107	0.173	0.836	0.662	0.0162	0.0194	—	0.171	—	0.0014	0.0002
.715	.59	.091	.367	.276	.0265	.0108	.172	.844	.672	.0166	.0202	—	.171	—	.0014	.0003
.825	.59	.096	.374	.278	.0264	.0110	.172	.852	.680	.0167	.0206	—	.171	—	.0014	.0003
.900	.59	.101	.377	.276	.0263	.0111	.170	.859	.689	.0168	.0211	—	.172	—	.0014	.0003
1.015	.59	.122	.392	.270	.0260	.0115	.172	.862	.690	.0171	.0215	—	.174	—	.0014	.0003
1.085	.58	.137	.398	.262	.0259	.0117	.177	.877	.700	.0170	.0221	—	.174	—	.0014	.0003

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TABLE 40.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;
RUN 21 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	OIL-COOLER					LEFT HAND ENGINE CHARGE-AIR DUCT				
							$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0394	0.0767	0.0373	0.32	0.075	0.187	0.112	0.0071	0.0014	—	0.323	—	0.0031	0.0011
5.0	.595	.715	.0396	.0744	.0348	.32	.066	.177	.111	.0071	.0013	—	.310	—	.0031	.0010
6.2	.700	.825	.0401	.0718	.0317	.32	.061	.178	.112	.0070	.0013	—	.308	—	.0031	.0010
7.0	.775	.900	.0404	.0767	.0363	.32	.060	.172	.112	.0070	.0013	—	.307	—	.0031	.0010
8.2	.885	1.015	.0415	.0830	.0415	.31	.059	.169	.110	.0069	.0012	—	.308	—	.0030	.0010
9.0	.950	1.085	.0425	.0937	.0512	.31	.058	.172	.114	.0068	.0012	—	.312	—	.0030	.0010

UPPER DUCT INLET																
C_l	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		NO BAFFLE	BAFFLE				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.64	0.133	0.514	0.381	0.0317	0.0192	0.152	0.826	0.674	0.0159	0.0188	—	0.162	—	0.0006	0.0001
.715	.64	.134	.513	.379	.0317	.0191	.154	.831	.677	.0161	.0192	—	.156	—	.0006	.0001
.825	.64	.133	.516	.383	.0316	.0192	.158	.838	.680	.0162	.0196	—	.153	—	.0006	.0001
.900	.64	.143	.518	.375	.0316	.0193	.158	.842	.684	.0162	.0197	—	.154	—	.0006	.0001
1.015	.64	.161	.532	.371	.0313	.0197	.162	.854	.692	.0165	.0205	—	.156	—	.0006	.0001
1.085	.64	.189	.546	.356	.0310	.0202	.174	.864	.690	.0165	.0210	—	.153	—	.0007	.0001

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TABLE 41.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;

RUN 22 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0222	0.0482	0.0260	0.55	0.118	0.332	0.214	0.0096	0.0035	—	0.598	—	0.0081	0.0059
5.0	.595	.715	.0222	.0440	.0219	.55	.115	.325	.210	.0095	.0034	—	.589	—	.0080	.0058
6.2	.700	.825	.0219	.0454	.0235	.54	.115	.319	.204	.0094	.0033	—	.580	—	.0079	.0055
7.0	.775	.900	.0219	.0496	.0277	.54	.117	.317	.200	.0093	.0032	—	.586	—	.0079	.0056
8.2	.885	1.015	.0219	.0534	.0315	.53	.125	.322	.197	.0091	.0032	—	.580	—	.0078	.0055
9.0	.950	1.085	.0224	.0656	.0432	.53	.132	.326	.194	.0090	.0032	—	.577	—	.0078	.0055

UPPER DUCT INLET																
		ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.47	0.102	0.517	0.415	0.0294	0.0180	0.050	0.109	0.059	0.0053	0.0006	—	0.097	—	0.0006	0.0001
.715	.47	.102	.519	.417	.0294	.0181	.053	.111	.058	.0054	.0006	—	.094	—	.0006	.0001
.825	.47	.103	.516	.413	.0293	.0179	.053	.114	.061	.0054	.0006	—	.093	—	.0006	.0001
.900	.47	.107	.515	.408	.0294	.0179	.054	.114	.060	.0054	.0006	—	.095	—	.0006	.0001
1.015	.46	.131	.521	.390	.0290	.0179	.058	.116	.058	.0055	.0007	—	.106	—	.0006	.0001
1.085	.46	.167	.534	.367	.0288	.0183	.075	.128	.053	.0055	.0007	—	.107	—	.0006	.0001

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TABLE 42.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 24 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
AIRPLANE		C_Z	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
							$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0753	0.1073	0.0320	0.86	0.175	0.835	0.660	0.0179	0.0212	—	0.696	—	0.0095	0.0085
5.0	.595	.715	.0754	—	—	.86	.177	.828	.651	.0175	.0206	—	.684	—	.0096	.0084
6.2	.700	.825	.0748	.1073	.0325	.84	.187	.822	.635	.0172	.0199	—	.669	—	.0096	.0082
7.0	.775	.900	.0745	.1082	.0337	.83	.198	.817	.619	.0170	.0194	—	.662	—	.0096	.0080
8.2	.885	1.015	.0744	—	—	.82	.204	.810	.606	.0166	.0188	—	.654	—	.0096	.0079
9.0	.950	1.085	.0751	.1226	.0475	.81	.217	.808	.591	.0164	.0185	—	.648	—	.0096	.0078

UPPER DUCT INLET																
C_L	$\frac{V_n}{V_o}$	ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
		$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		NO BAFFLE	BAFFLE				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.81	0.237	0.700	0.463	0.0438	0.0395	0.158	0.686	0.528	0.0162	0.0143	—	0.238	—	0.0014	0.0004
.715	.82	.238	.700	.462	.0439	.0396	.162	.697	.535	.0165	.0148	—	.238	—	.0015	.0004
.825	.82	.240	.697	.457	.0440	.0395	.165	.704	.539	.0166	.0151	—	.237	—	.0015	.0004
.900	.82	.245	.698	.453	.0439	.0395	.166	.706	.540	.0166	.0152	—	.244	—	.0015	.0004
1.015	.81	.255	.704	.449	.0435	.0396	.168	.716	.548	.0167	.0157	—	.243	—	.0015	.0004
1.085	.82	.279	.709	.430	.0434	.0399	.179	.732	.553	.0170	.0163	—	.242	—	.0015	.0004

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TABLE 43.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE; RUN 25 CONFIGURATION 3.

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_P}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
							EXIT									
a	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0608	0.0881	0.0273	0.90	0.175	0.325	0.150	0.0187	0.0067	—	0.716	—	0.0099	0.0092
5.0	.595	.715	.0613	.0879	.0266	.89	.179	.323	.144	.0184	.0065	—	.704	—	.0099	.0090
6.2	.700	.825	.0615	.0849	.0234	.87	.193	.330	.137	.0180	.0065	—	.698	—	.0097	.0088
7.0	.775	.900	.0616	.0886	.0270	.86	.208	.333	.125	.0177	.0065	—	.684	—	.0099	.0087
8.2	.885	1.015	.0621	.0922	.0301	.85	.216	.337	.121	.0173	.0064	—	.671	—	.0099	.0084
9.0	.950	1.085	.0630	.0992	.0362	.84	.229	.342	.113	.0170	.0064	—	.664	—	.0099	.0083

UPPER DUCT INLET															
		ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT			
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		EXIT					EXIT									
		NO BAFFLE	BAFFLE				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	0.81	0.237	0.700	0.463	0.0438	0.0395	0.158	0.686	0.528	0.0162	0.0143	—	0.238	—	0.0014	0.0004
.715	.82	.238	.700	.462	.0439	.0398	.162	.697	.535	.0165	.0148	—	.238	—	.0015	.0004
.825	.82	.240	.697	.457	.0440	.0395	.165	.704	.539	.0166	.0151	—	.237	—	.0015	.0004
.900	.82	.245	.698	.453	.0439	.0395	.166	.706	.540	.0166	.0152	—	.244	—	.0015	.0004
1.015	.81	.255	.704	.449	.0435	.0396	.168	.716	.548	.0167	.0157	—	.243	—	.0015	.0004
1.085	.82	.279	.709	.430	.0434	.0399	.179	.732	.553	.0170	.0163	—	.242	—	.0015	.0004

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TABLE 44.- RESULTS OF COOLING AND DRAG TESTS OF $\frac{1}{14}$-SCALE MODEL OF XB-36 INBOARD NACELLE;

RUN 26 CONFIGURATION 3

COMPLETE MODEL						LOWER DUCT INLET										
							OIL-COOLER					ENGINE CHARGE-AIR DUCTS				
AIRPLANE		C_l	C_{D_i}	C_{D_F}	C_{D_p}	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
α	C_L		INTERNAL	TOTAL	EXTERNAL		NO BAFFLE	BAFFLE				BAFFLE	EXIT			
3.0	0.415	0.535	0.0486	0.0795	0.0309	0.94	—	0.158	—	0.0203	0.0034	—	0.674	—	0.0097	0.0083
5.0	.595	.715	.0491	.0813	.0322	.93	—	.159	—	.0200	.0033	—	.658	—	.0097	.0081
6.2	.700	.825	.0495	.0823	.0328	.92	—	.171	—	.0196	.0035	—	.644	—	.0098	.0079
7.0	.775	.900	.0499	.0823	.0324	.91	—	.177	—	.0194	.0036	—	.637	—	.0098	.0078
8.2	.885	1.015	.0509	.0806	.0297	.90	—	.195	—	.0189	.0039	—	.623	—	.0099	.0076
9.0	.950	1.085	.0521	.0848	.0327	.88	—	.220	—	.0183	.0043	—	.620	—	.0098	.0075

UPPER DUCT INLET																
		ENGINE AIR DUCT					INTERCOOLER DUCTS					CABIN AIR DUCT				
C_l	$\frac{V_n}{V_o}$	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$ EXIT		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}	$\frac{\Delta H}{q_o}$		$\frac{\Delta P}{q_o}$	$\frac{Q}{FV_o}$	C_{D_i}
		BAFFLE	EXIT				NO BAFFLE	BAFFLE				BAFFLE	EXIT			
0.535	1.19	—	0.435	—	0.0618	0.0307	—	0.407	—	0.0247	0.0114	—	0.721	—	0.0034	0.0032
.715	1.19	—	.435	—	.0618	.0307	—	.414	—	.0249	.0117	—	.745	—	.0035	.0034
.825	1.19	—	.436	—	.0615	.0306	—	.415	—	.0251	.0118	—	.760	—	.0036	.0036
.900	1.19	—	.438	—	.0612	.0307	—	.417	—	.0252	.0119	—	.770	—	.0036	.0037
1.015	1.18	—	.447	—	.0606	.0310	—	.421	—	.0253	.0121	—	.787	—	.0036	.0039
1.085	1.18	—	.455	—	.0601	.0314	—	.424	—	.0255	.0123	—	.806	—	.0037	.0041

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FIGURE LEGENDS

Figure 1.- General arrangement of flap; airfoil and flap ordinates for 1/14-scale model of XB-36 inborad nacelle.

Figure 2.- Rear view of nacelle showing annular exhaust slot, spinner, separating plate, and flap nacelle gap. 1/14-scale model of XB-36 inboard nacelle.

Figure 3.- Views of configuration A; 1/14-scale model of XB-36 inboard nacelle.

Figure 4.- Modification of configuration A; 1/14-scale model of XB-36 inboard nacelle.

Figure 5.- Views of configuration B; 1/14-scale model of XB-36 inboard nacelle.

Figure 6.- Modifications of configuration B; 1/14-scale model of XB-36 inboard nacelle.

Figure 7.- Views of configuration C; 1/14-scale model of XB-36 inboard nacelle.

Figure 8.- General arrangement of 1/14-scale model of the XB-36 inboard nacelle with scoop air inlet at 0.55c.

Figure 9.- Profile and ordinates of first and second drooped nose forms; center line of 1/14-scale model of XB-36 inboard nacelle.

Figure 10.- 1/14-scale model of the XB-36 inboard nacelle; configuration 2.

(a) Front view showing air inlets.

Figure 10.- Continued.

(b) Front view showing duct arrangement at rear spar.

Figure 10.- Continued.

(c) Rear top view showing air exits.

Figure 10.- Concluded.

(d) Rear bottom view showing air exits.

FIGURE LEGENDS - Continued

Figure 11.- General arrangement of 1/14-scale model of the XB-36 inboard nacelle with leading-edge air inlets.

Figure 12.- 1/14-scale model of the XB-36 inboard nacelle; configuration 3.

(a) Front view

Figure 12.- Continued.

(b) Three-quarter front view of lower surface. (Model inverted.)

Figure 12.- Concluded.

(c) Three-quarter front view.

Figure 13.- 1/14-scale model of the XB-36 inboard nacelle sealed for the no-flow condition; configuration 3.

(a) Three-quarter front view.

Figure 13.- Continued.

(b) Rear top view.

Figure 13.- Concluded.

(c) Rear bottom view.

Figure 14.- 1/14-scale model of the XB-36 inboard nacelle with flaps deflected 38.5°; configuration 3.

(a) Three-quarter front view of lower surface. (Model inverted.)

Figure 14.- Concluded.

(b) Rear view

Figure 15.- Spanwise variation of section drag coefficient obtained from wake survey of 1/14-scale model of XB-36 inboard nacelle. Configuration 3, run 22, $c_l = 0.535$, $R \cong 2.5 \times 10^6$. LTT test 351.

FIGURE LEGENDS - Continued

Figure 16.- Lift characteristics of the 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; pressure drops and flow coefficients set for the cruise condition at 10,000 feet; $R \cong 2.5 \times 10^6$. LTT test 351.

Figure 17.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. Configuration 1; high-speed condition at 30,000 feet; $R \cong 2.5 \times 10^6$. LTT test 329.

Figure 18.- Variation of total pressure defect at the cooling-air duct exits with flow coefficient for the 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; runs 1 to 7; no baffles; $R \cong 2.5 \times 10^6$. LTT test 351.

Figure 19.- Drag characteristics of 1/14-scale model of XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. High speed condition at 30,000 feet; $R \cong 2.5 \times 10^6$. LTT tests 329, 331, and 351.

Figure 20.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. Maximum flow condition; $R \cong 2.5 \times 10^6$. LTT tests 329, 331, and 351.

Figure 21.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. Configuration 2; $R \cong 2.5 \times 10^6$. LTT test 331.

Figure 22.- Effects on nacelle drag of normal and spanwise sliding doors on the left hand intercooler cooling air duct exits; 1/14-scale model of XB-36 inboard nacelle. Configuration 2; low nacelle air flow; $R \cong 2.5 \times 10^6$. LTT test 331.

Figure 23.- Effect on nacelle drag due to closing in varying combinations, the exits of the intercooler and engine charge-air ducts; 1/14-scale model of the XB-36 inboard nacelle. $R \cong 2.5 \times 10^6$; LTT test 331.

Figure 24.- Effect on nacelle drag of increased flow through the intercooler ducts; 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; $R \cong 2.5 \times 10^6$. LTT test 351.

FIGURE LEGENDS - Continued

Figure 25.- Drag comparison of configurations 2 and 3; 1/14-scale model of the XB-36 inboard nacelle. Cruise condition at varying altitudes, $R \cong 2.5 \times 10^6$.

(a) 10,000 feet.

Figure 25.- Continued.

(b) 20,000 feet.

Figure 25.- Continued.

(c) 30,000 feet.

Figure 25.- Continued.

(d) 35,000 feet.

Figure 25.- Concluded.

(e) 40,000 feet.

Figure 26.- Comparison of drag effects of configurations 2 and 3 with different types of doors on the oil-cooler and intercooler cooling-air duct exits; climb condition at 40,000 feet. $R \cong 2.5 \times 10^6$; LTT tests 331 and 351.

Figure 27.- Variation of external nacelle drag with flow coefficient for cruise and climb with different types of doors on the oil-cooler and intercooler cooling-air duct exits. $R \cong 2.5 \times 10^6$.

Figure 28.- Average total pressure defect at several chordwise positions within the engine air duct; 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; $R \cong 2.5 \times 10^6$; LTT test 351.

(a) High-speed condition at 30,000 feet; run 22.

Figure 28.- Concluded.

(b) Climb condition at 40,000 feet; run 24.

Figure 29.- Effects on nacelle drag of no and partial flow through ducting system of 1/14-scale model of the XB-36 inboard nacelle; configuration 2; $R \cong 2.5 \times 10^6$. LTT test 331.

FIGURE LEGENDS - Concluded

Figure 30.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle with all air inlets and exits sealed and faired. Configuration 3; R ≅ 2.5×10^6; LTT test 351.

Figure 31.- Drag scale effect of 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; cruise condition at 40,000 feet. TDT test 723.

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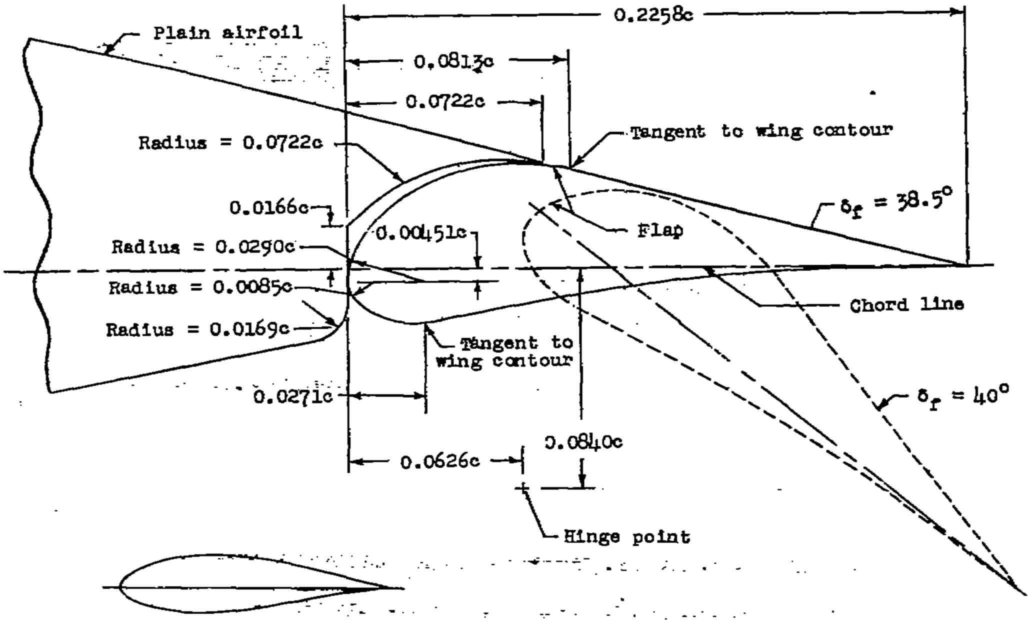

Airfoil Ordinates

Station	Upper Surface	Lower Surface
0	1.083	-0.236
.312	1.977	-1.134
.625	2.508	-1.690
1.25	3.275	-2.478
2.5	4.412	-3.460
3.75	5.297	-4.143
5.0	6.048	-4.707
7.5	7.333	-5.626
10	8.395	-6.368
11	9.128	-6.869
12.5	9.297	-6.983
15	10.059	-7.493
20	11.269	-8.260
25	12.108	-8.757
30	12.609	-8.964
35	12.740	-8.875
40	12.601	-8.551
43	12.407	-8.273
45	12.234	-8.058
50	11.674	-7.426
55	10.944	-6.688
60	10.064	-5.862
65	9.040	-4.964
70	7.893	-4.012
75	6.633	-3.043
80	5.285	-2.078
85	3.894	-1.172
90	2.512	-.426
95	1.214	-.004
100	0	0

L.E. Radius: 3.329
Radius Center at Station, 3.266, Ordinate, 0.421

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Flap Ordinates

Station	Upper Surface	Station	Lower Surface
77.517	0.236	77.462	-0.708
77.812	.982	77.589	-.986
78.351	1.749	77.812	-1.273
79.144	2.478	78.137	-1.551
80.142	3.106	78.541	-1.787
81.280	3.586	78.979	-1.951
82.469	3.877	79.413	-2.040
83.619	3.991	79.810	-2.065
84.656	3.936	80.134	-2.023
85.554	3.759		

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[Stations and ordinates given in percent of airfoil chord]

Figure 1.- General arrangement of flap; airfoil and flap ordinates for 1/14-scale model of XB-36 inboard nacelle.

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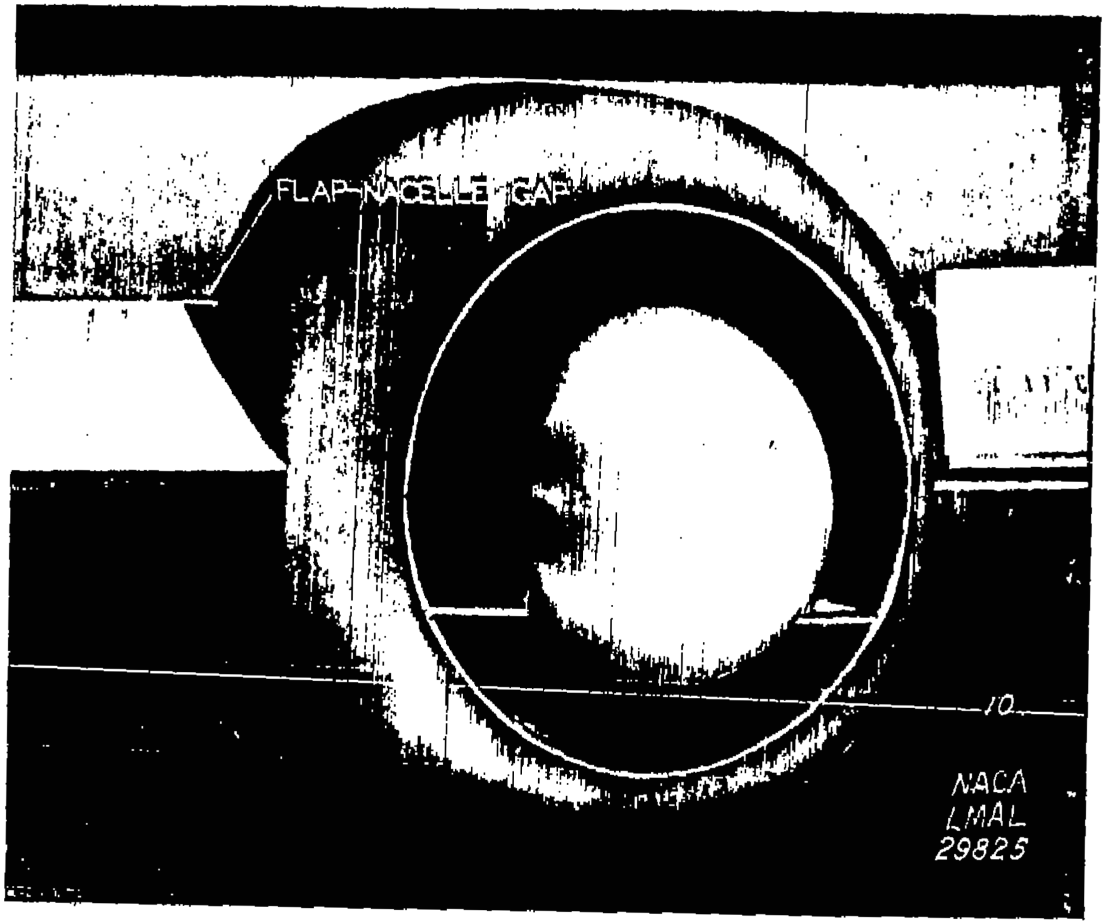

Figure 2.- Rear view of nacelle showing annular exhaust slot, spinner, separating plate, and flap nacelle gap. 1/14-scale model of XB-36 inboard nacelle.

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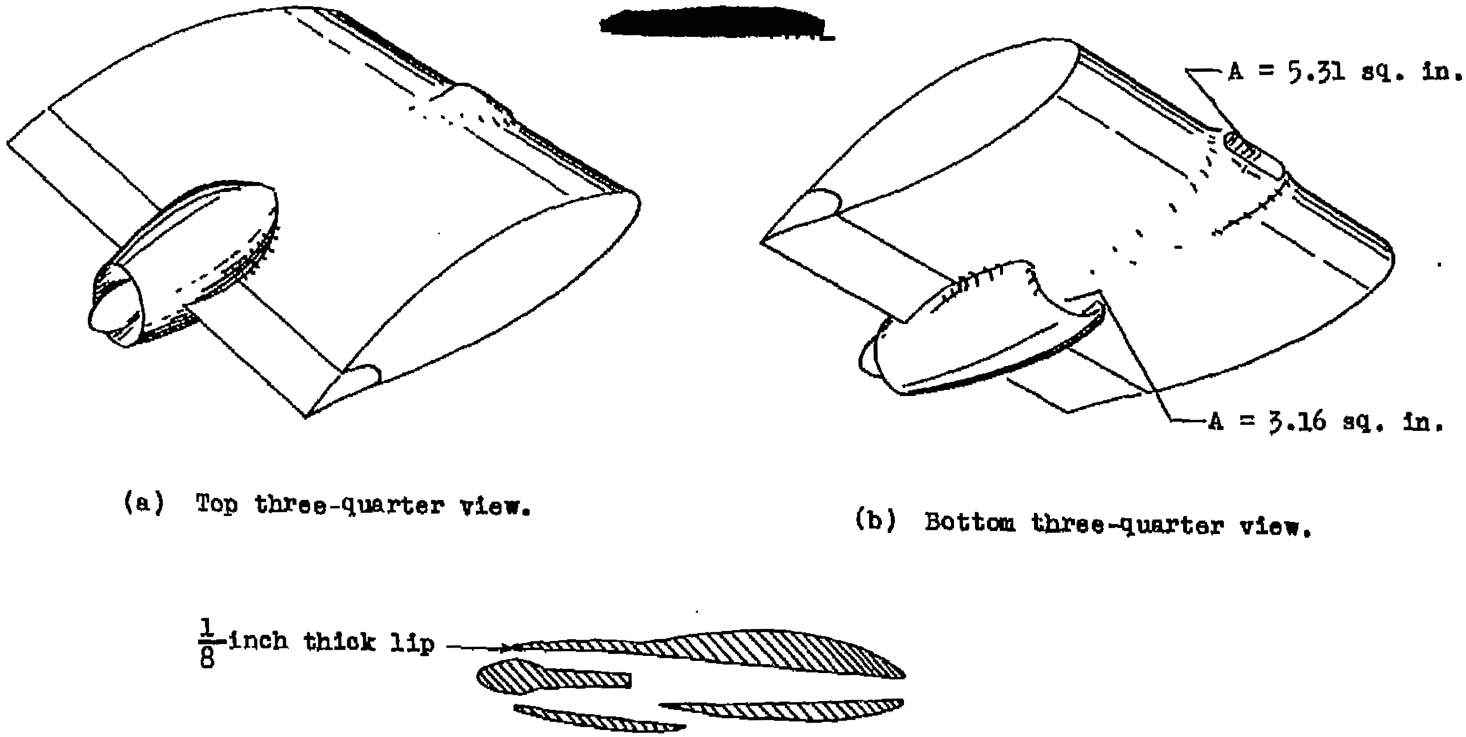

(a) Top three-quarter view.

(b) Bottom three-quarter view.

(c) Center line section through ducts.

Figure 3.- Views of configuration A; 1/14-scale model of XB-36 inboard nacelle.

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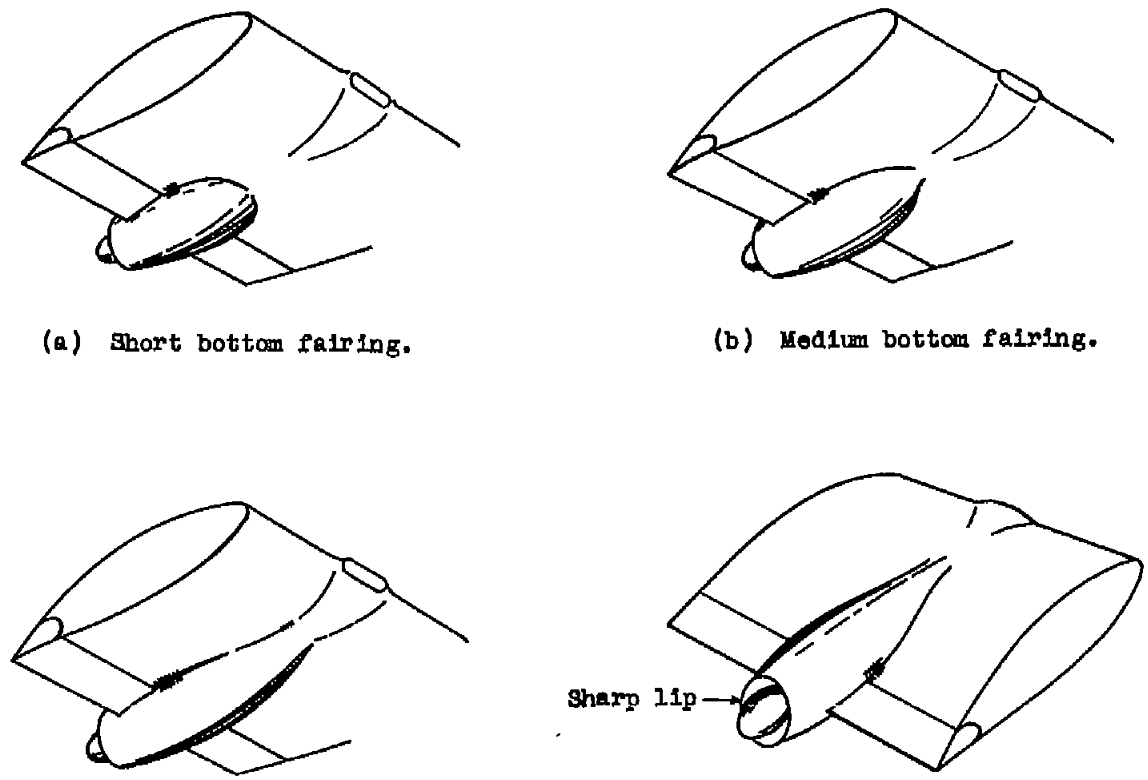

(a) Short bottom fairing.

(b) Medium bottom fairing.

(c) Long bottom fairing.

(d) Long top fairing.

Figure 4.- Modification of configuration A; 1/14-scale model of XB-36 inboard nacelle.

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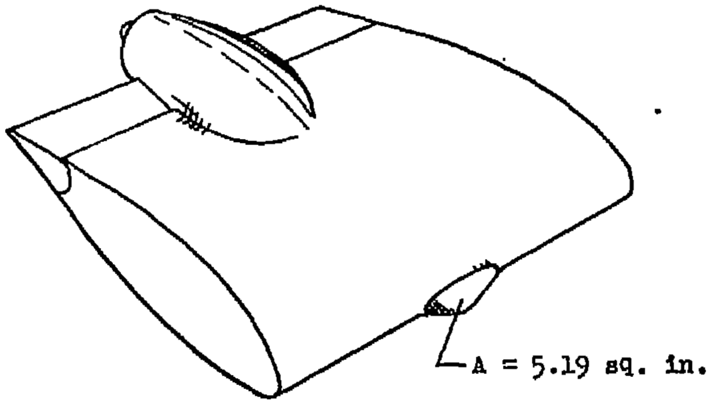
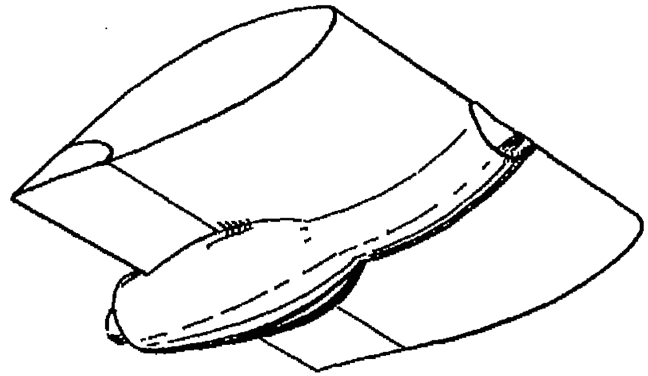
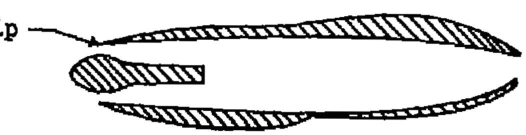


(a) Top three-quarter view.



(b) Bottom three-quarter view.



(c) Center line section through ducts.

Figure 5.- Views of configuration B; 1/14-scale model of XB-36 inboard nacelle.

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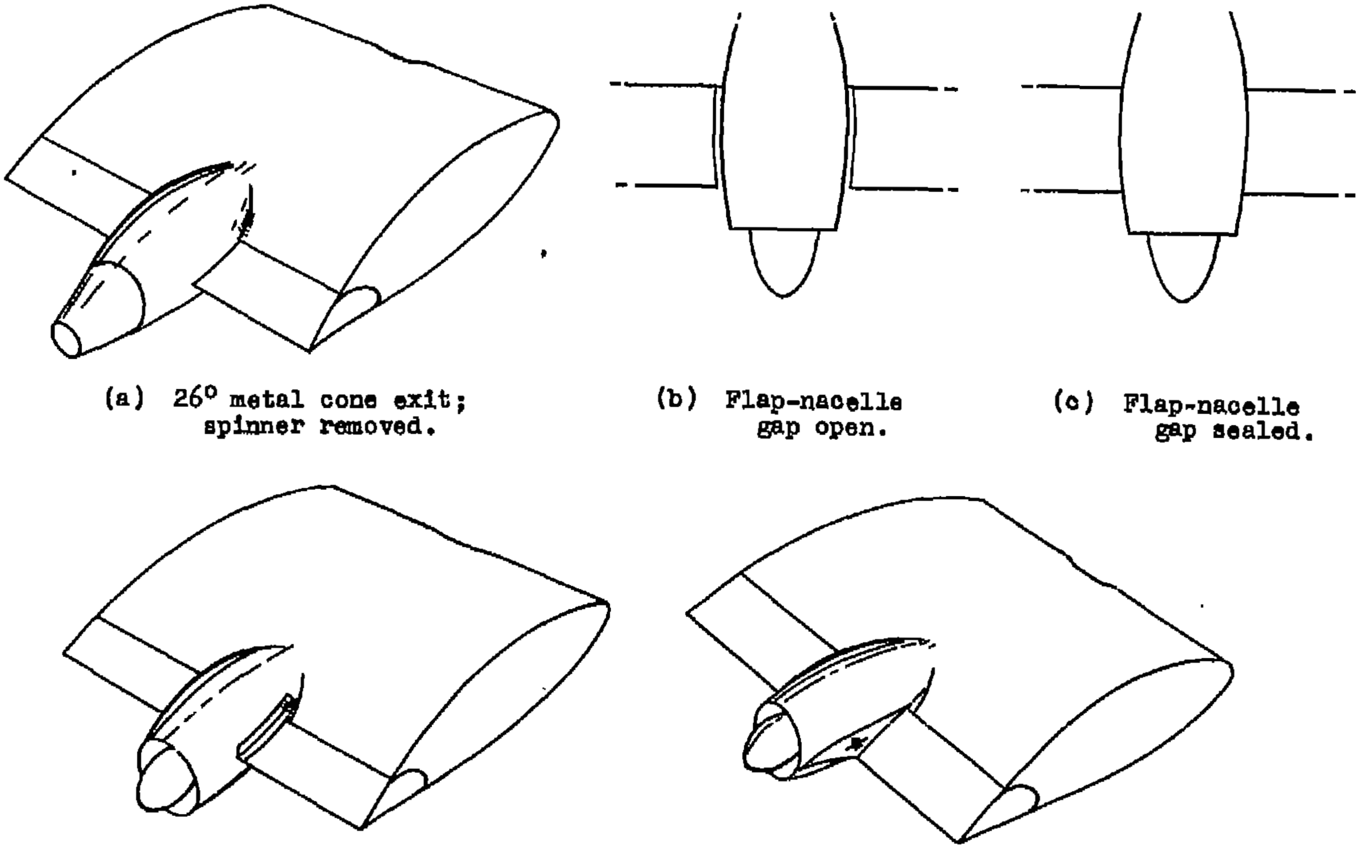

(a) 26° metal cone exit; spinner removed.

(b) Flap-nacelle gap open.

(c) Flap-nacelle gap sealed.

(d) Normal exit with spinner; flap nacelle gap sealed with cellulose tape.

(e) Normal exit with spinner; flap-nacelle gap sealed with clay fillet.

Figure 6.- Modifications of configuration B; 1/14-scale model of XB-36 inboard nacelle.

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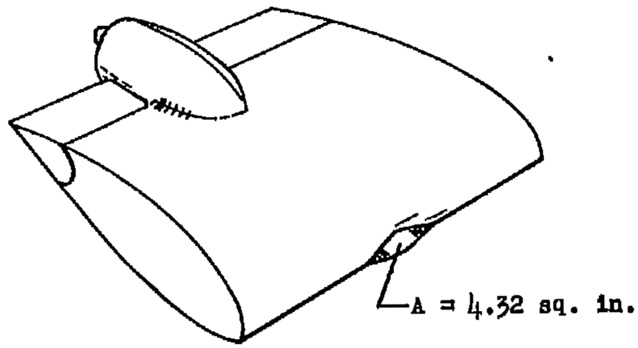
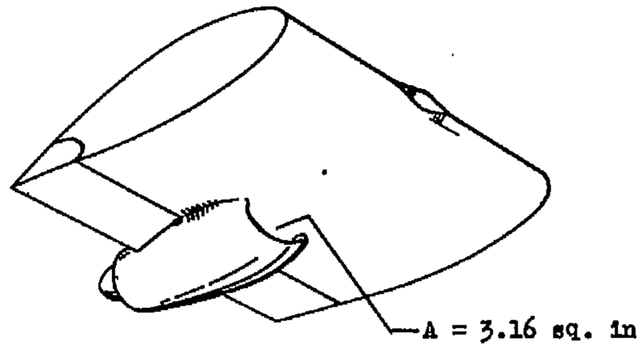


(a) Top three-quarter view.



(b) Bottom three-quarter view.

(c) Center line section through ducts.

Figure 7.- Views of configuration C; 1/14-scale model of XB-36 inboard nacelle.

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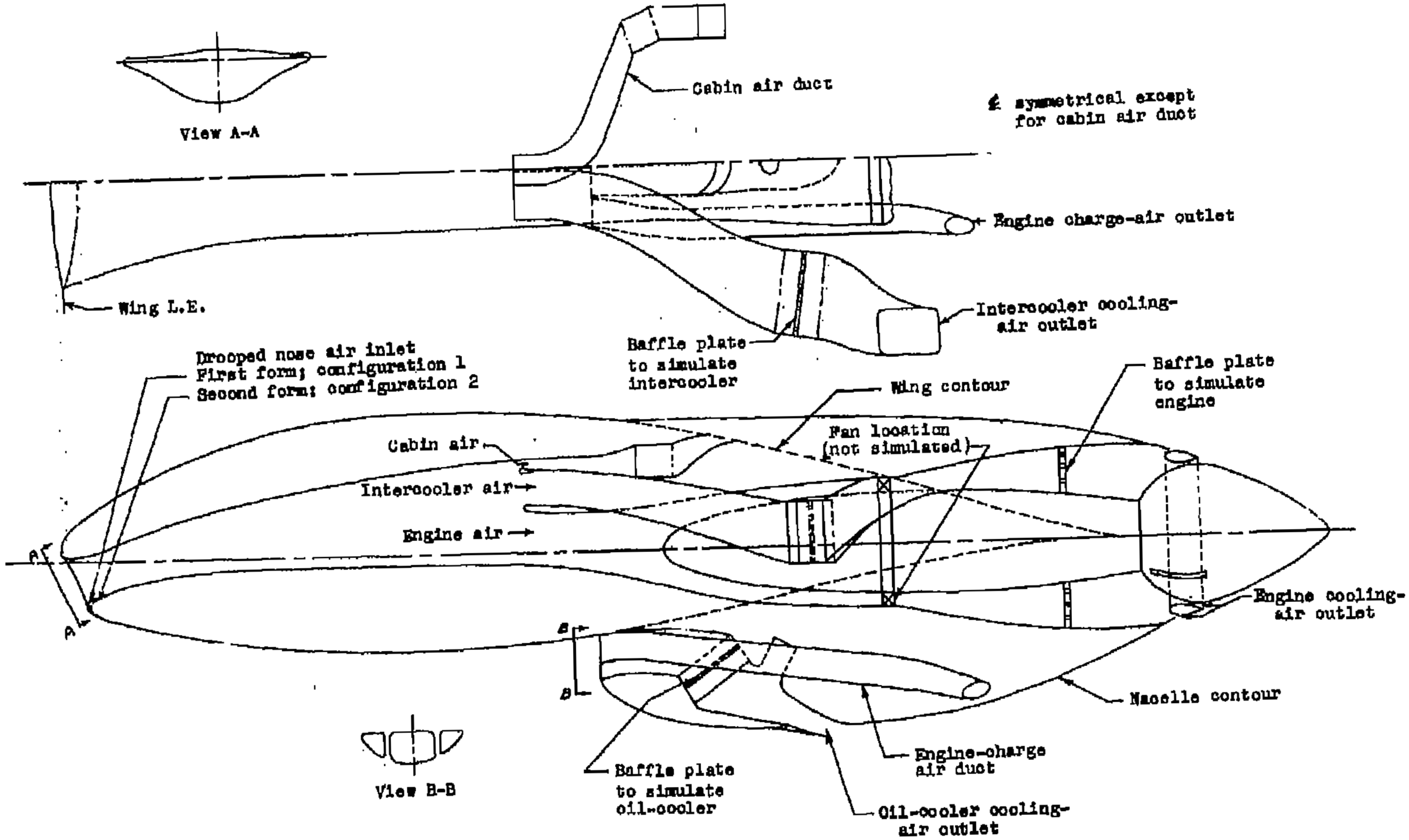

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Figure 8 .- General arrangement of 1/14-scale model of the XB-36 inboard nacelle with scoop air inlet at 0.55c.

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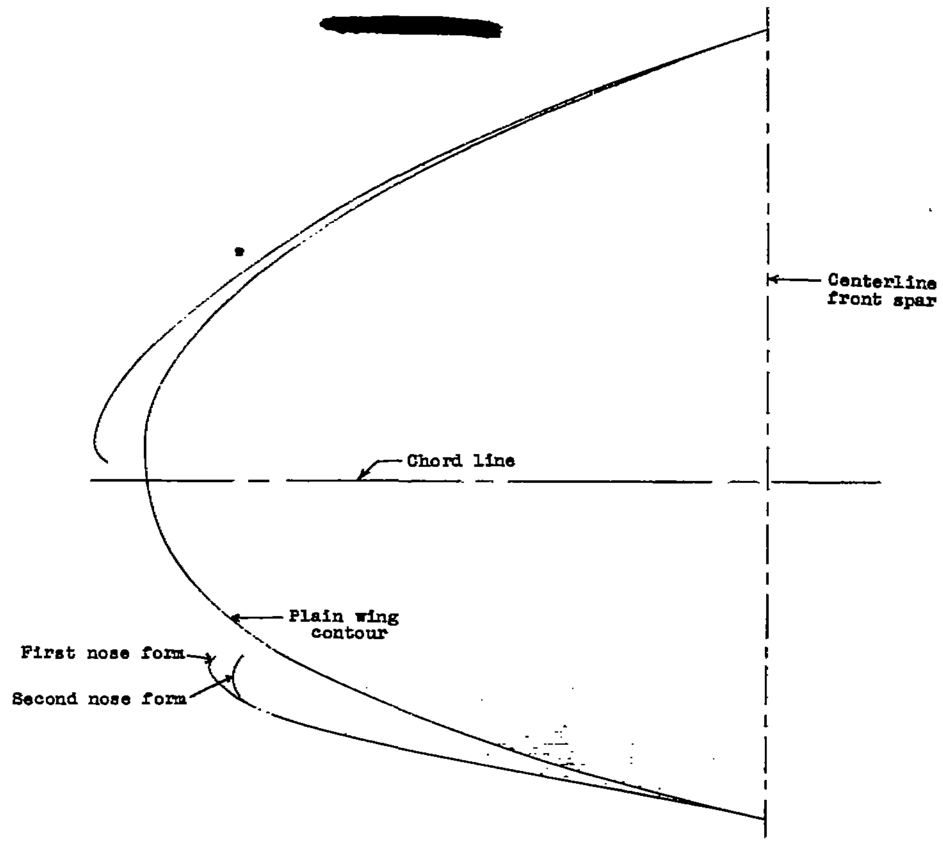

First nose form

[Stations and ordinates given in percent of airfoil chord]

UPPER LIP		LOWER LIP	
Station	Ordinate	Station	Ordinate
-0.948	0.472	1.243	-3.814
-.990	.864	1.264	-3.940
-.864	1.306	1.370	-4.088
-.632	1.762	1.475	-4.193
-.379	2.128	1.686	-4.362
-.105	2.444	2.107	-4.615
.105	2.663	2.50	-4.804
.312	2.878	3.75	-5.175
.625	3.165	5.0	-5.462
1.25	3.696	7.5	-5.963
2.50	4.648	10	-6.448
3.75	5.500	[a]12	[a]-6.869
5.0	6.203		
7.5	7.400		
10	8.416		
[a]12	[a]9.128		
Lip radius, 0.299 Radius center at Station, -0.653 Ordinate, 0.652		Lip radius, 0.299 Radius center at Station, 1.542 Ordinate, -3.814	

Second nose form

[Stations and ordinates given in percent of airfoil chord]

UPPER LIP		LOWER LIP	
Station	Ordinate	Station	Ordinate
-0.948	0.472	1.686	-3.940
-.990	.864	2.107	-4.594
-.864	1.306	2.50	-4.787
-.632	1.762	3.75	-5.175
-.379	2.128	5.0	-5.462
-.105	2.444	7.5	-5.963
.105	2.663	10	-6.448
.312	2.878	[a]12	[a]-6.869
.625	3.165		
1.25	3.696		
2.50	4.648		
3.75	5.500		
5.0	6.203		
7.5	7.400		
10	8.416		
[a]12	[a]9.128		
Lip radius, 0.299 Radius center at Station, -0.653 Ordinate, 0.652		Lip radius, 0.674 Radius center at Station, 2.360 Ordinate, -4.016	

[a]Tangent to wing contour.

[redacted]

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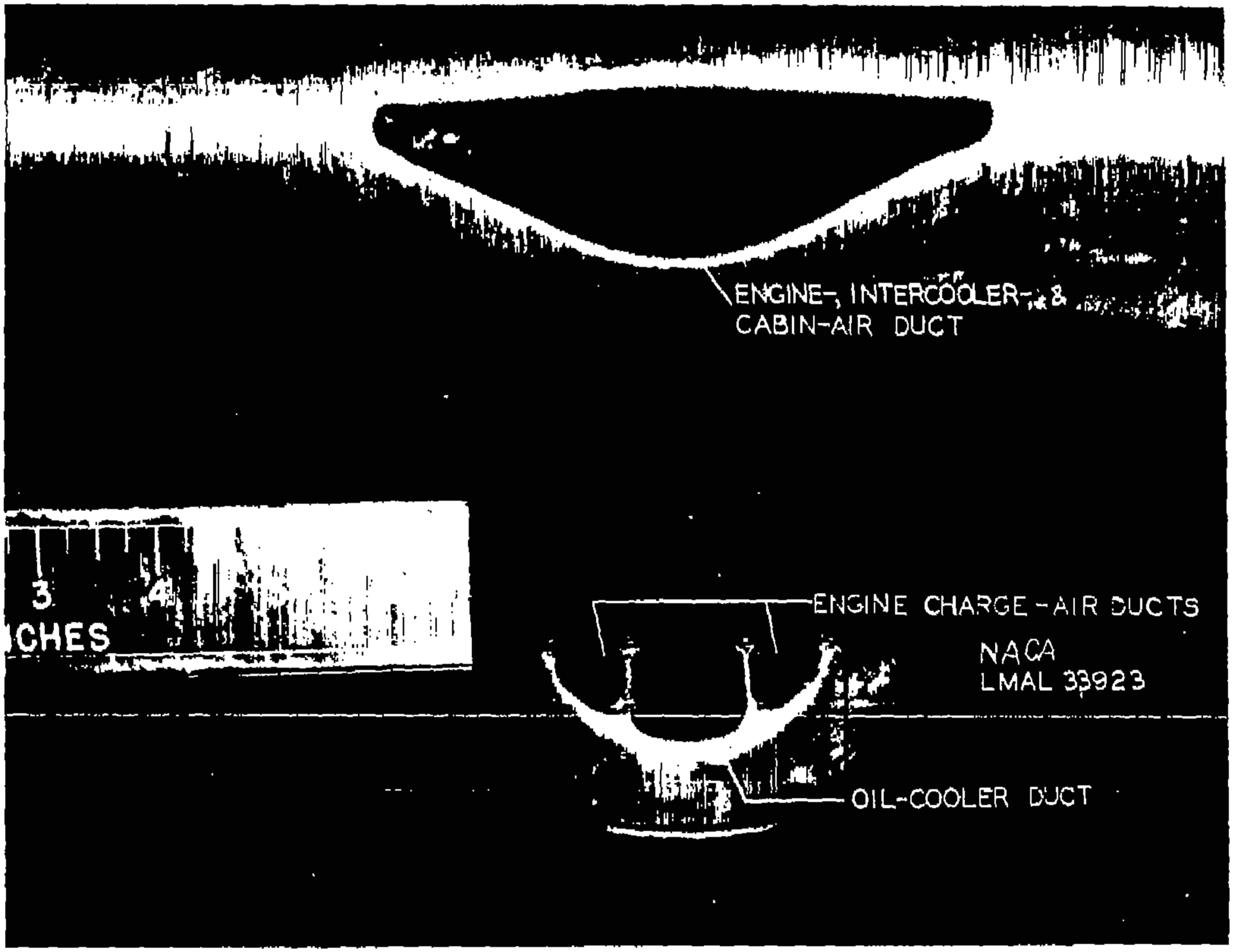
Figure 9.- Profile and ordinates of first and second drooped nose forms; centerline of 1/14-scale model of XB-36 inboard nacelle.

[redacted]



(a) Front view showing air inlets.

Figure 10.- 1/14-scale model of the XB-36 inboard nacelle; configuration 2.

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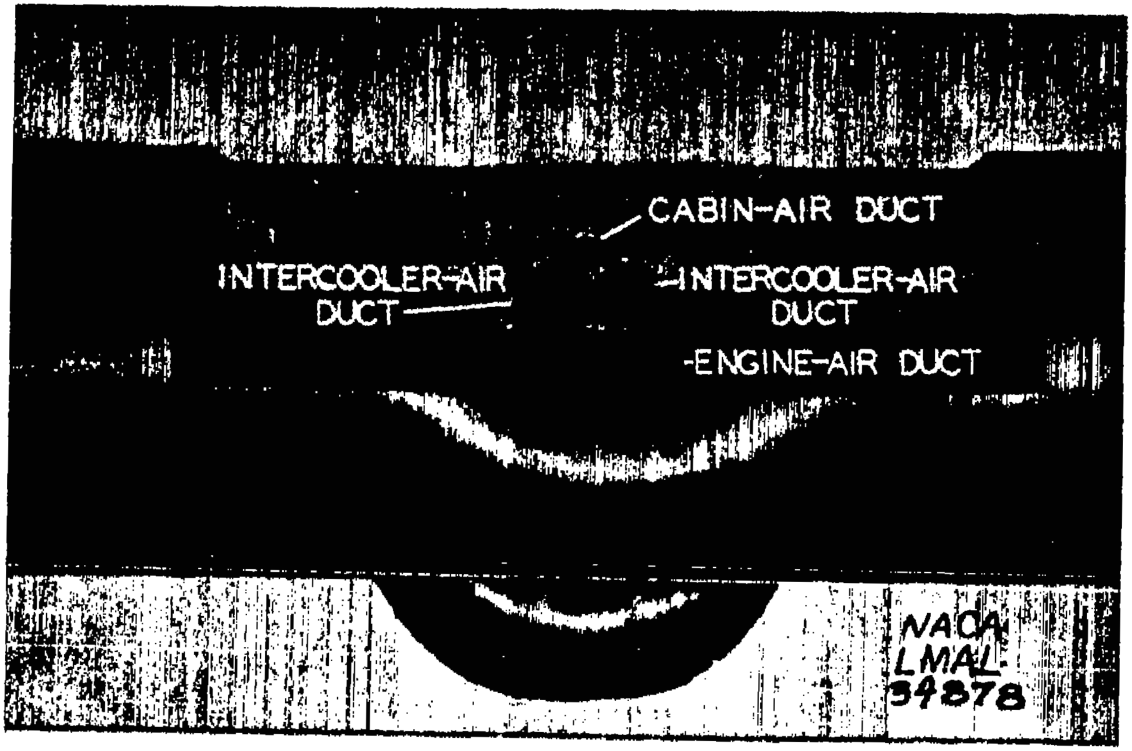

(b) Front view showing duct arrangement at rear spar.

Figure 10.- Continued.

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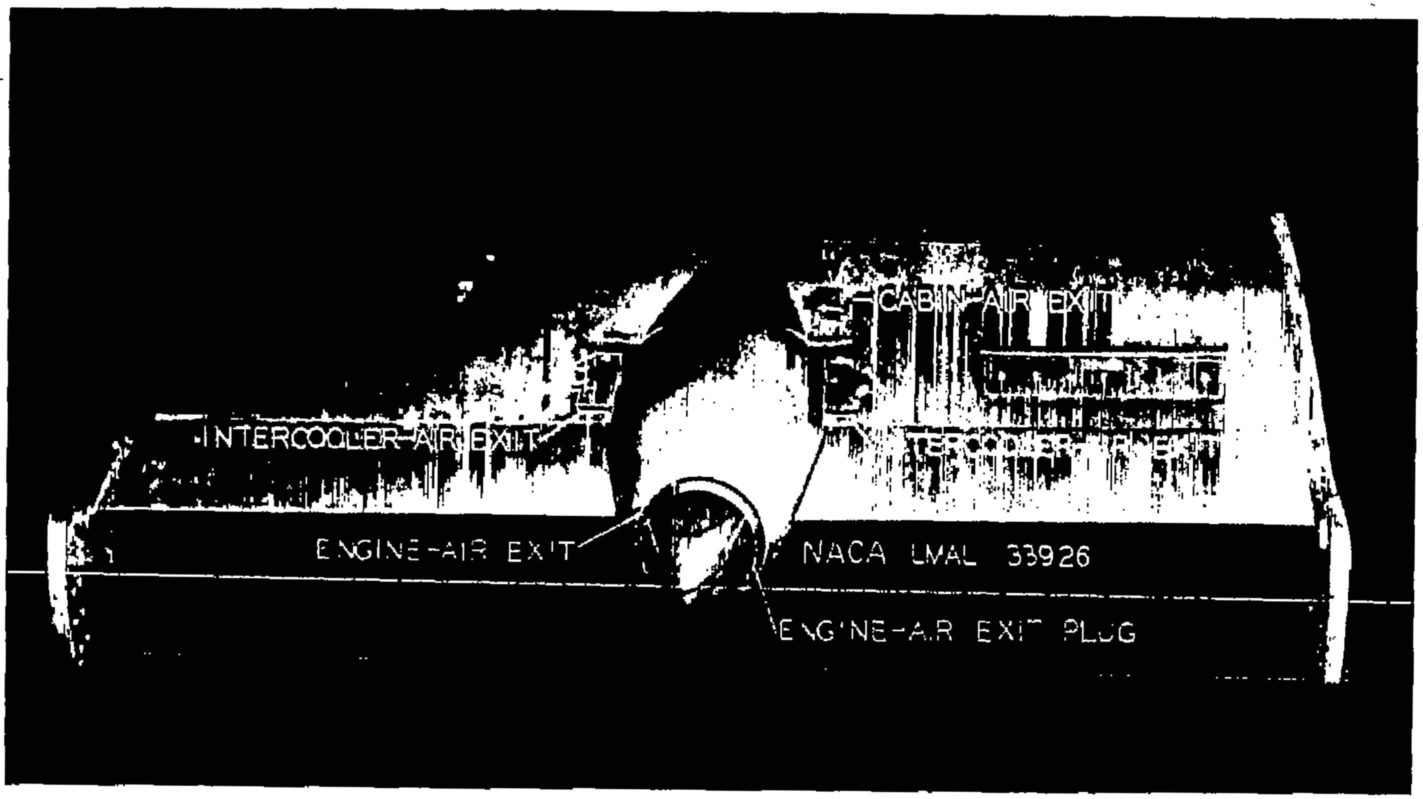

[redacted]

(c) Rear top view showing air exits.

Figure 10.- Continued.

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(d) Rear bottom view showing air exits.

Figure 10.- Concluded.

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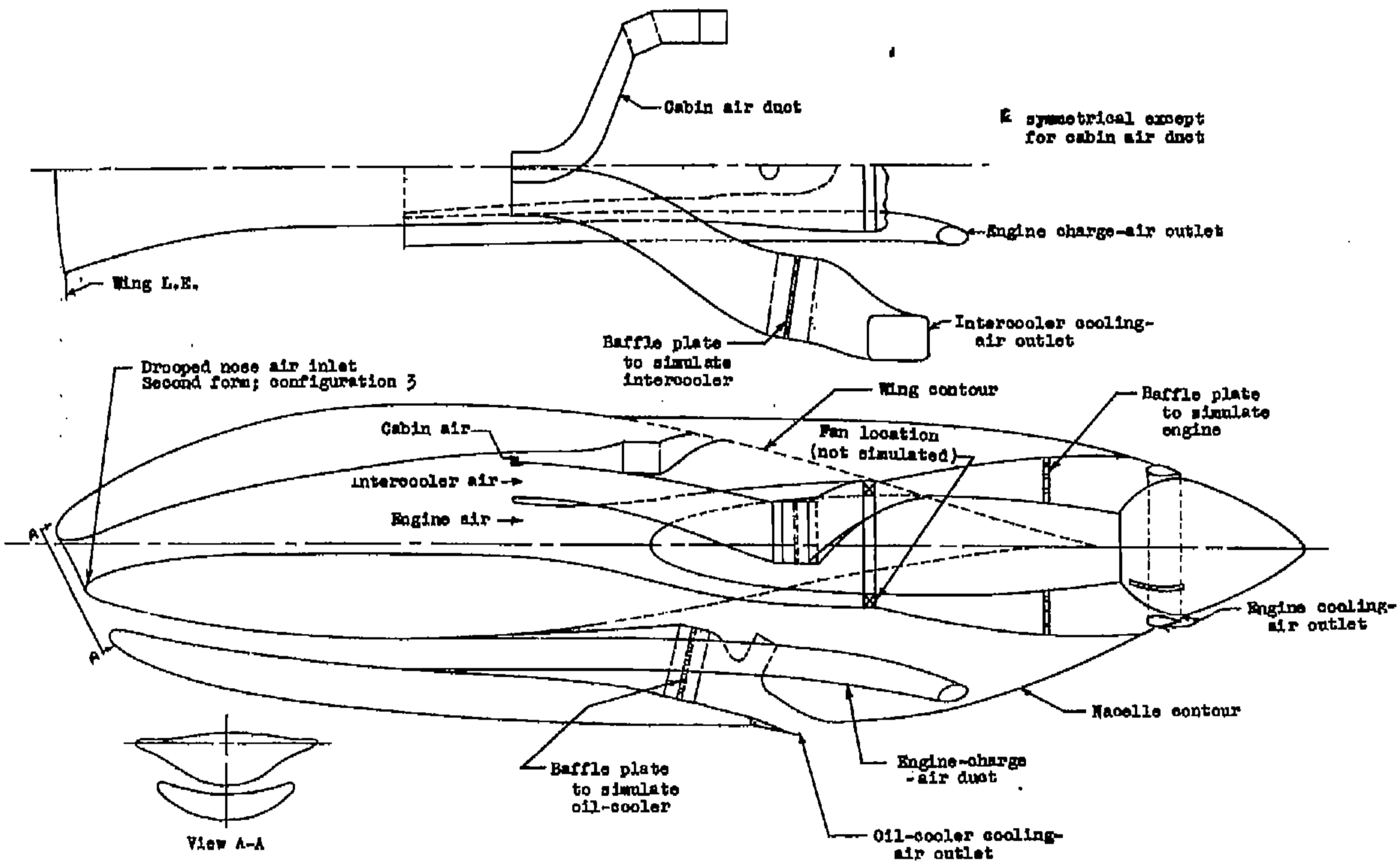

[redacted]

Figure 11.- General arrangement of 1/14-scale model of the XB-36 inboard nacelle with leading-edge air inlets.

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[redacted]

(a) Front view.

Figure 12.- 1/14-scale model of the XB-36 inboard nacelle; configuration 3.

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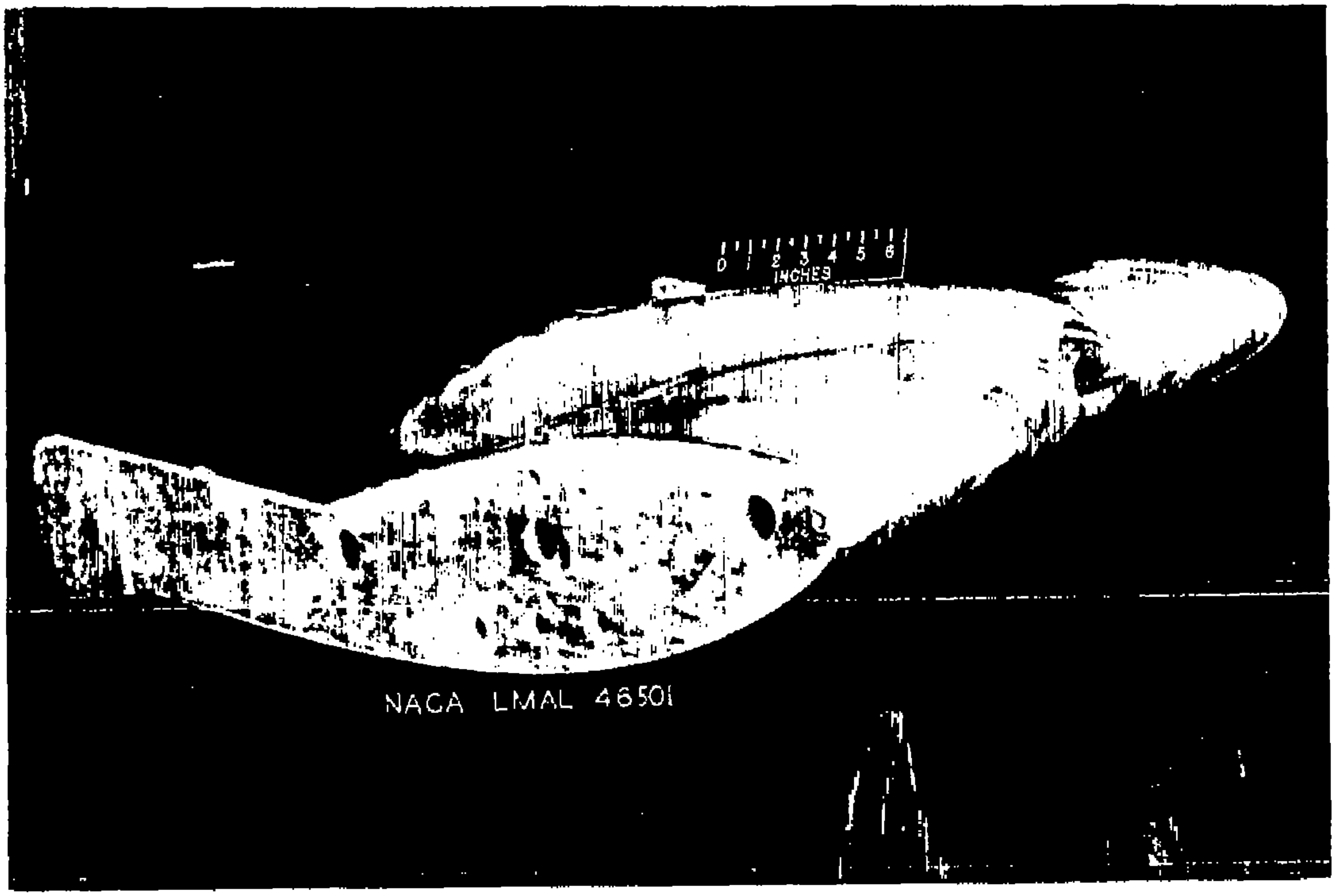

(b) Three-quarter front view of lower surface. (Model inverted).

Figure 12.- Continued. [redacted]

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(c) Three-quarter front view.

Figure 12.- Concluded. [redacted]

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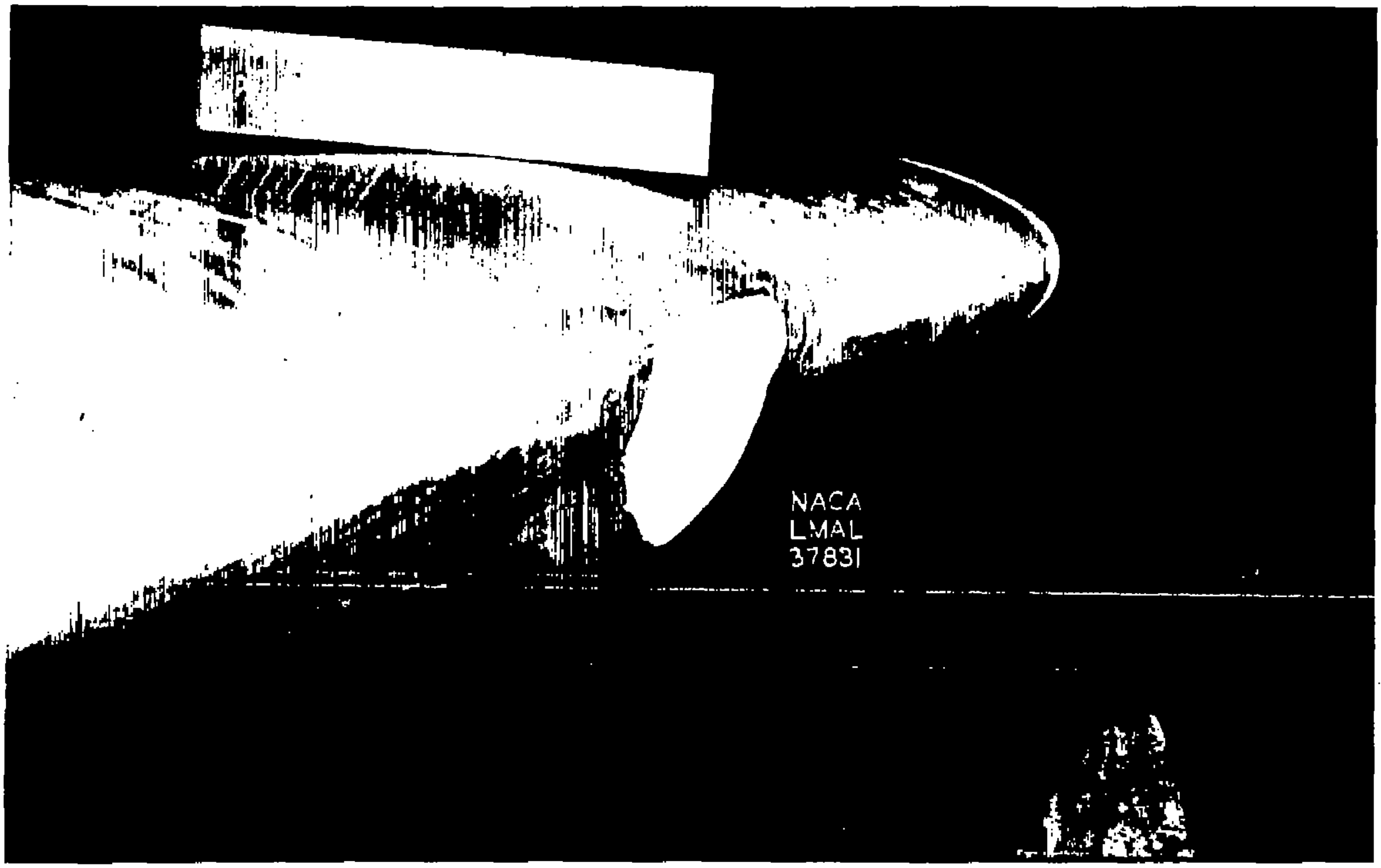

(a) Three-quarter front view.

Figure 13.- 1/14-scale model of the XB-36 inboard nacelle sealed for the no-flow condition; configuration 3.

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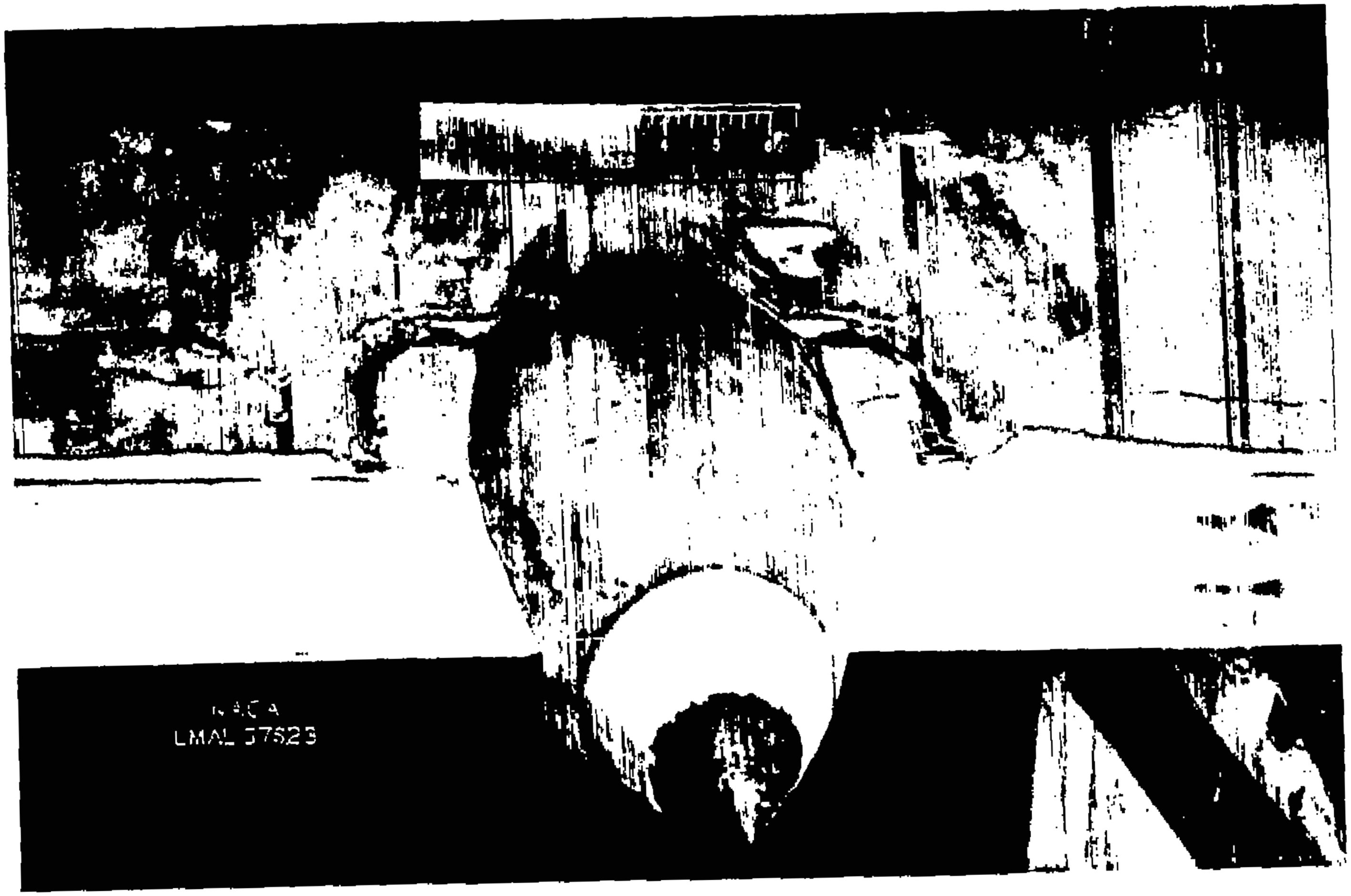
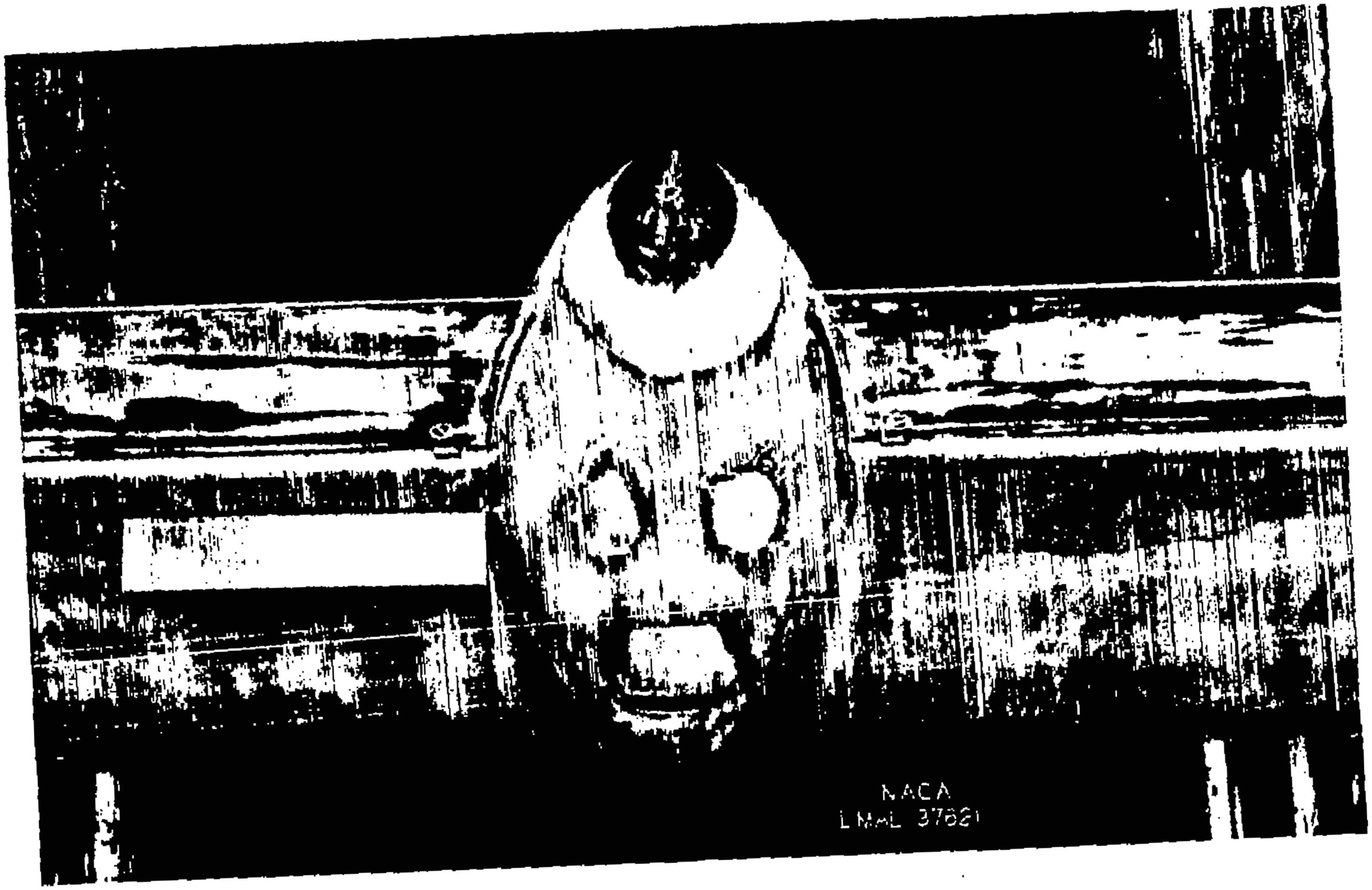


(b) Rear top view.

Figure 13.- Continued.



(c) Rear bottom view.

Figure 13.- Concluded.

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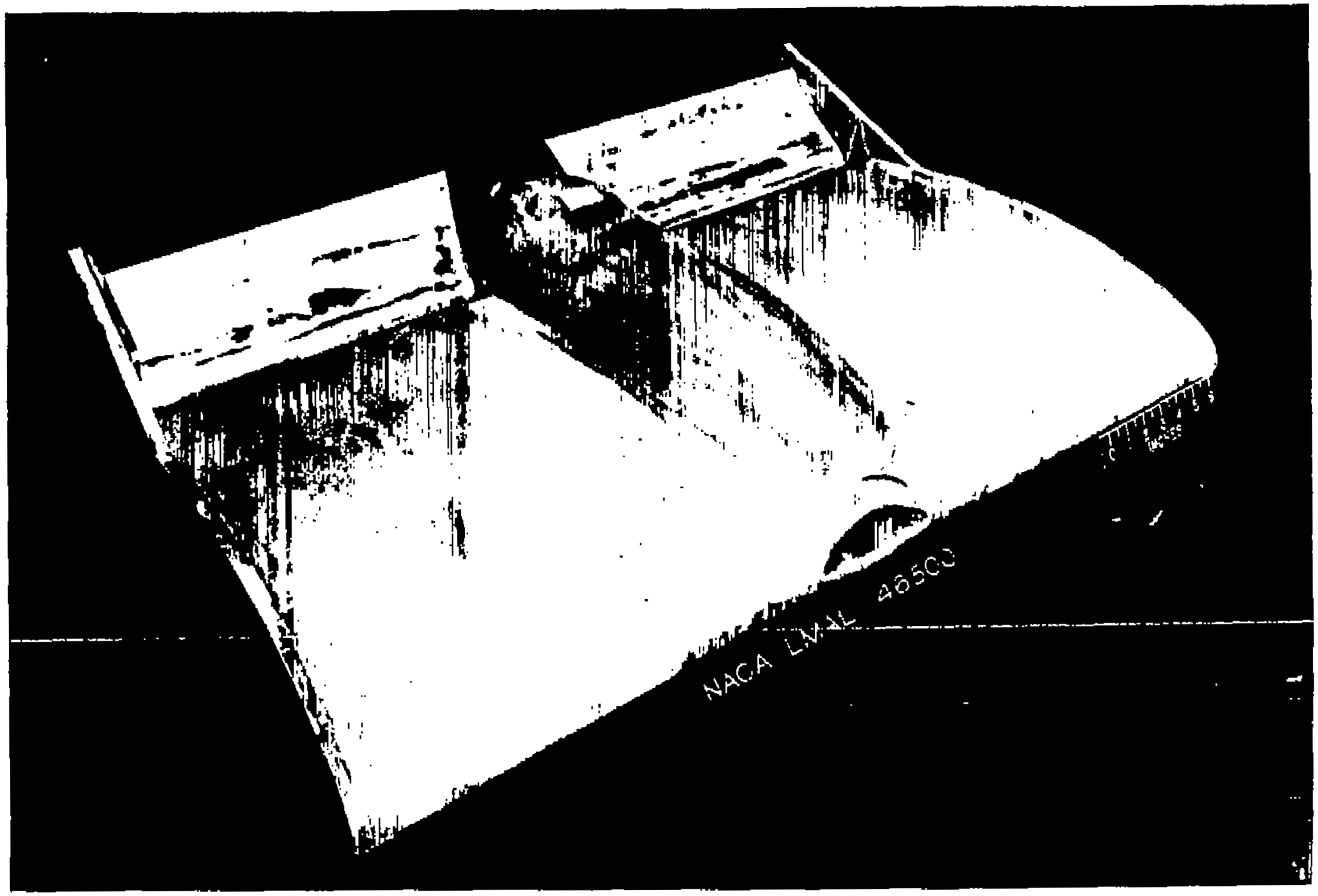

(a) Three-quarter front view of lower surface. (Model inverted)

Figure 14.- 1/14-scale model of the XB-36 inboard nacelle with flaps deflected 38.5°; configuration 3.

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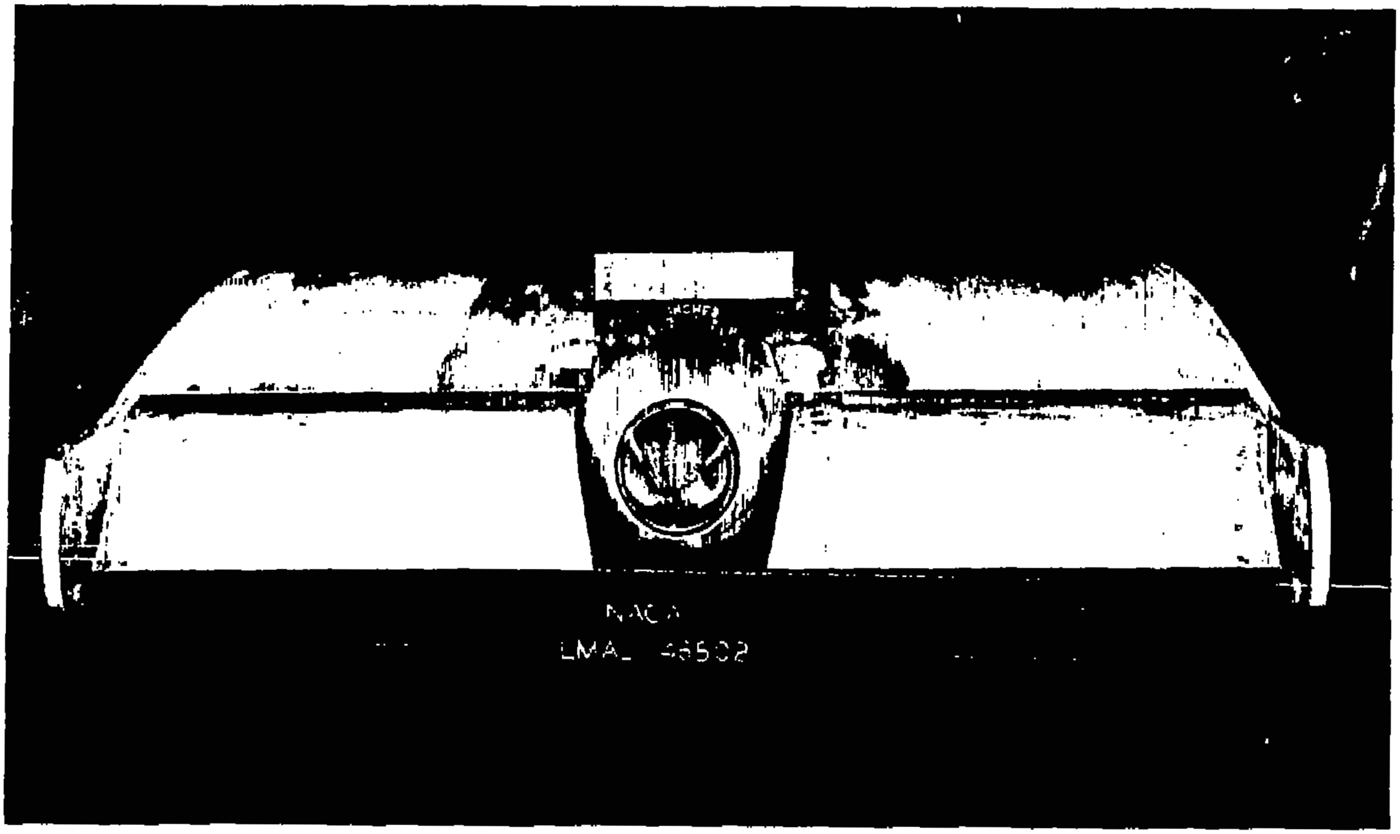

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(b) Rear view.

Figure 14.- Concluded.

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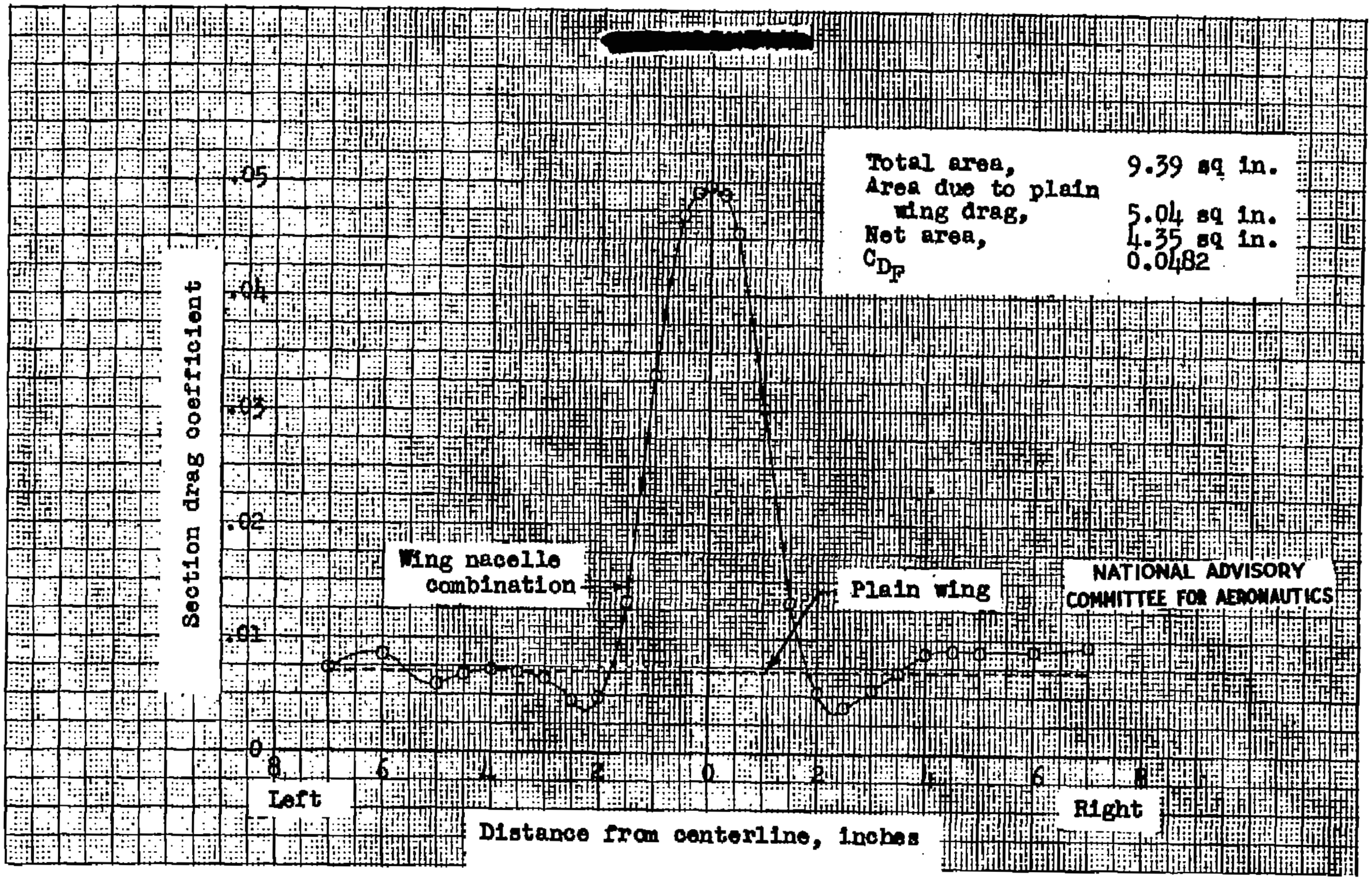

Figure 15.- Spanwise variation of section drag coefficient obtained from wake survey of 1/14-scale model of XB-36 inboard nacelle. Configuration 3, run 22, $c_l = 0.535$, $R \cong 2.5 \times 10^6$. LTT test 351.

[redacted]

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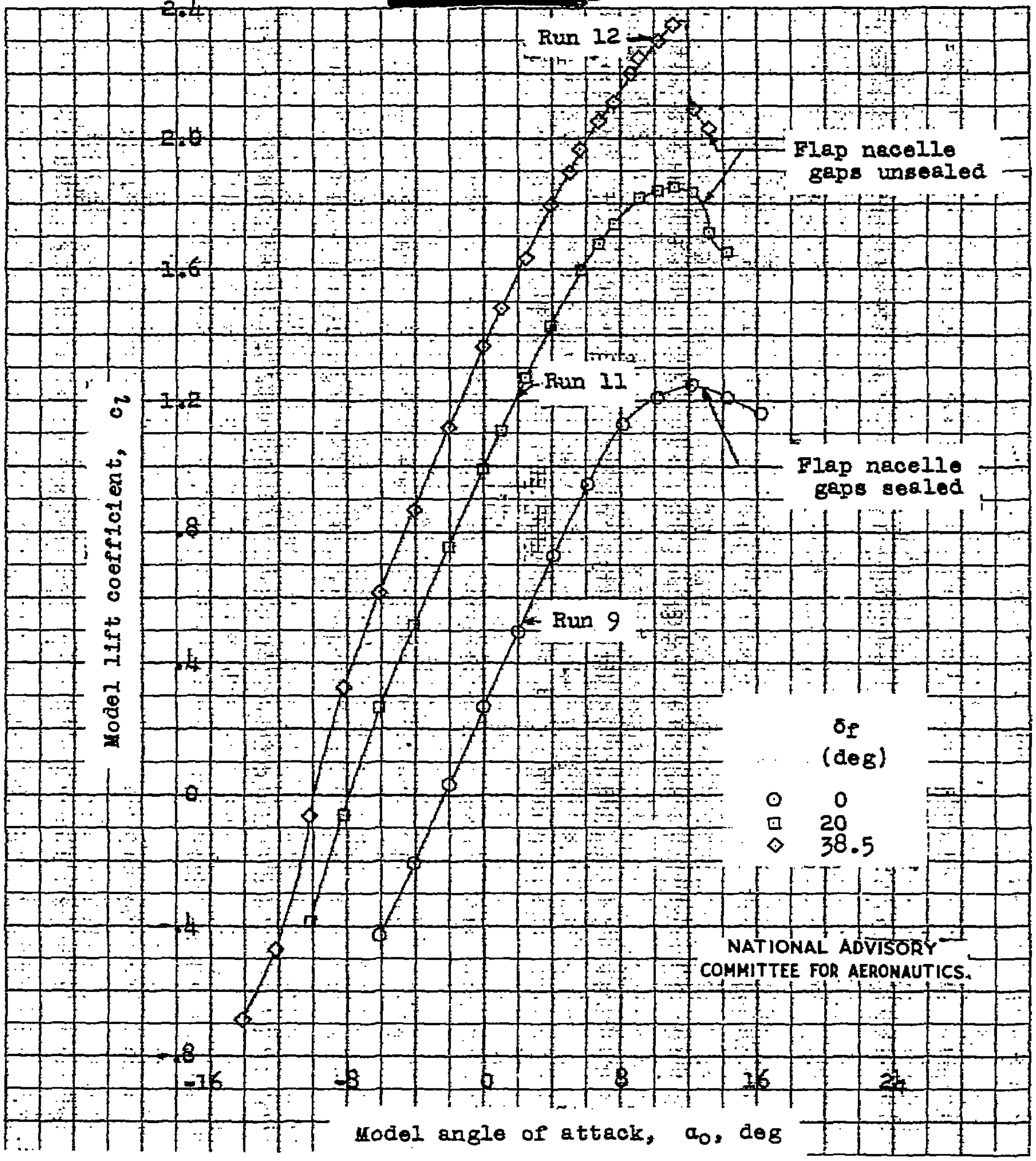

Figure 16.- Lift characteristics of the 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; pressure drops and flow coefficients set for the cruise condition at 10,000 feet; $R \cong 2.5 \times 10^6$. LTT test 351.

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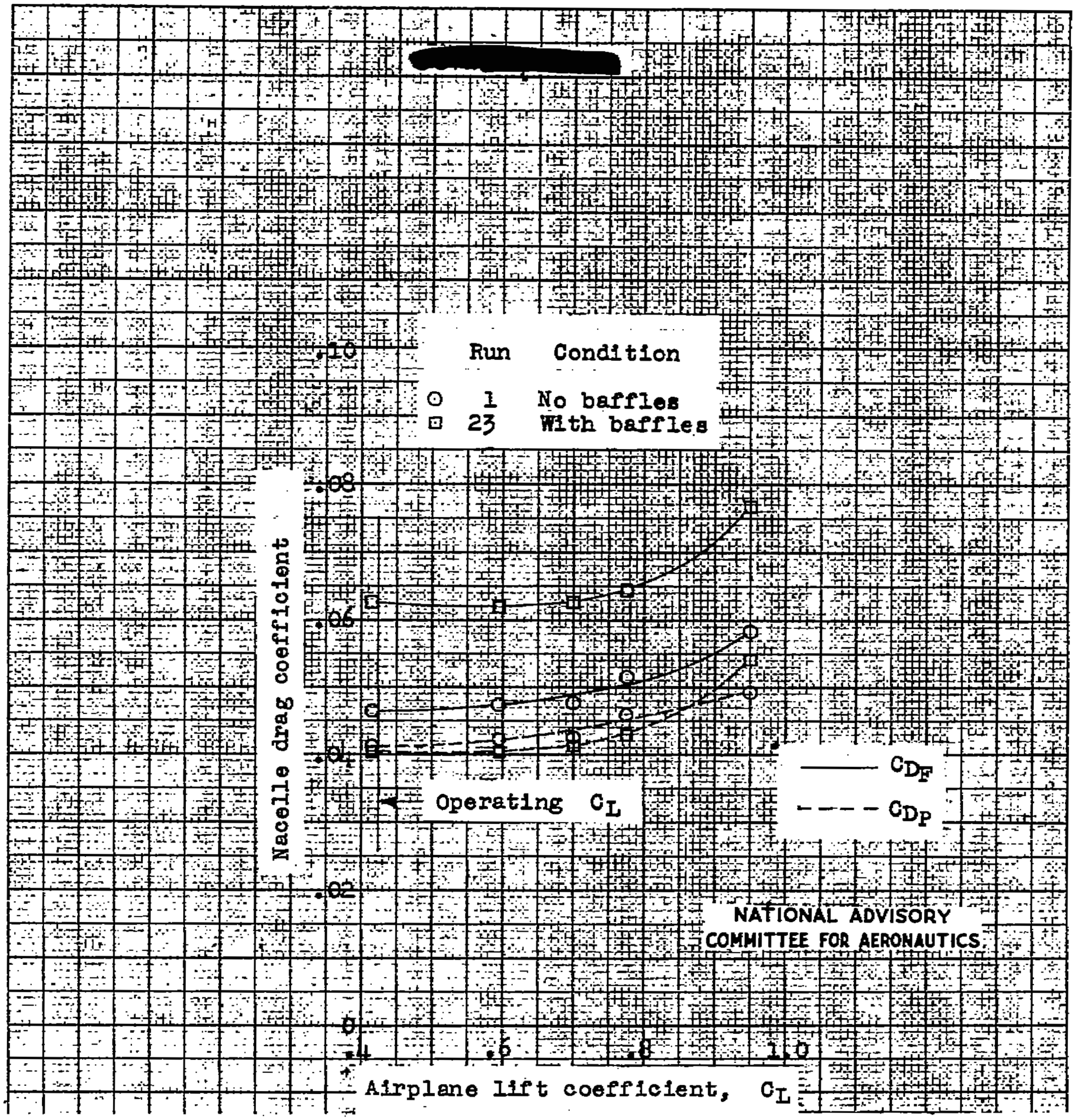

Figure 17.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. Configuration 1; high-speed condition at 30,000 feet; $R \cong 2.5 \times 10^6$. LTT test 329.

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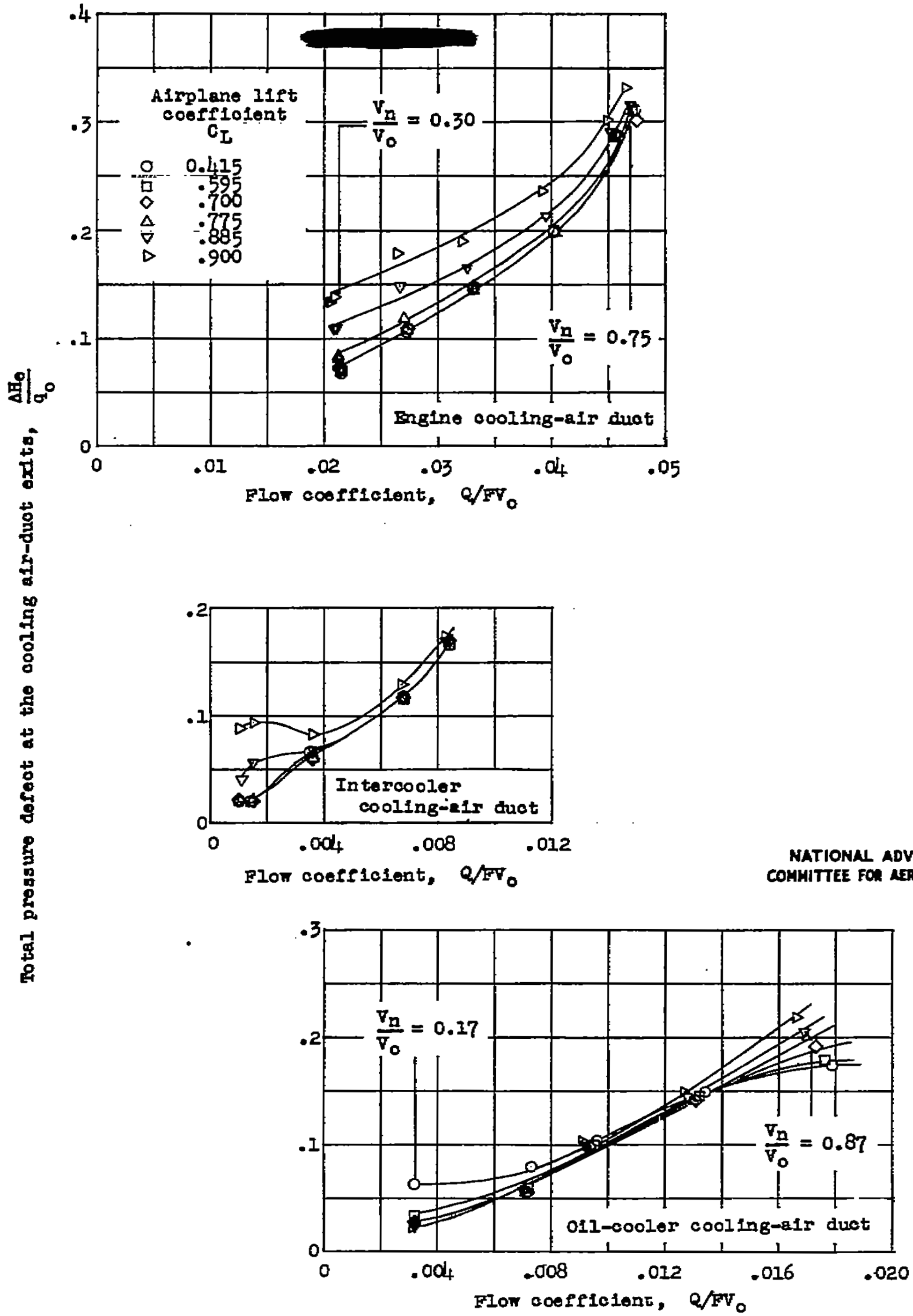

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Figure 18.- Variation of total pressure defect at the cooling-air duct exits with flow coefficient for the 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; runs 1 to 7; no baffles; $R \cong 2.5 \times 10^6$. LTT test 351.

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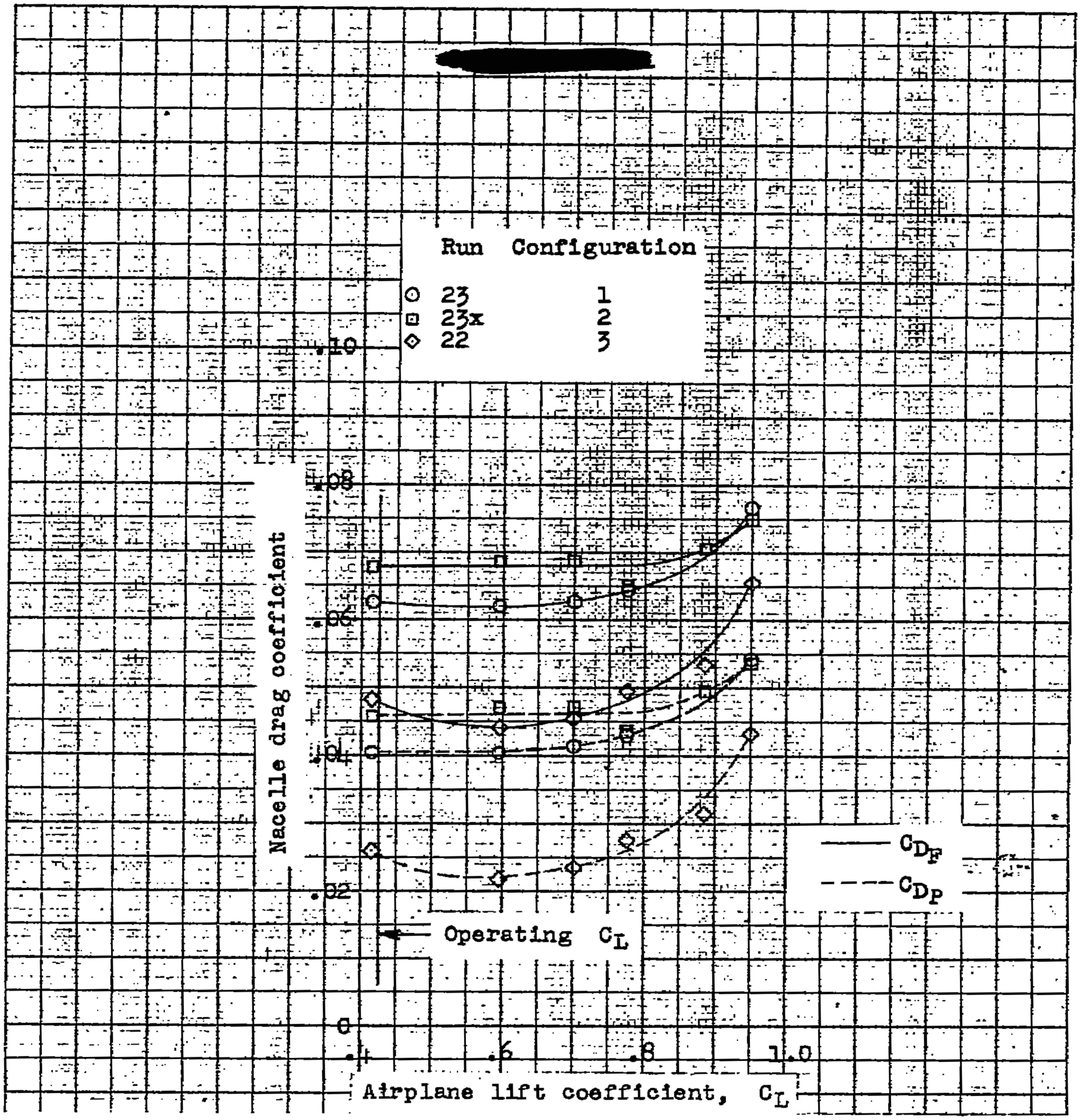

Figure 19.- Drag characteristics of 1/14-scale model of XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. High speed condition at 30,000 feet; $R \cong 2.5 \times 10^6$. LTT tests 329, 331, and 351.

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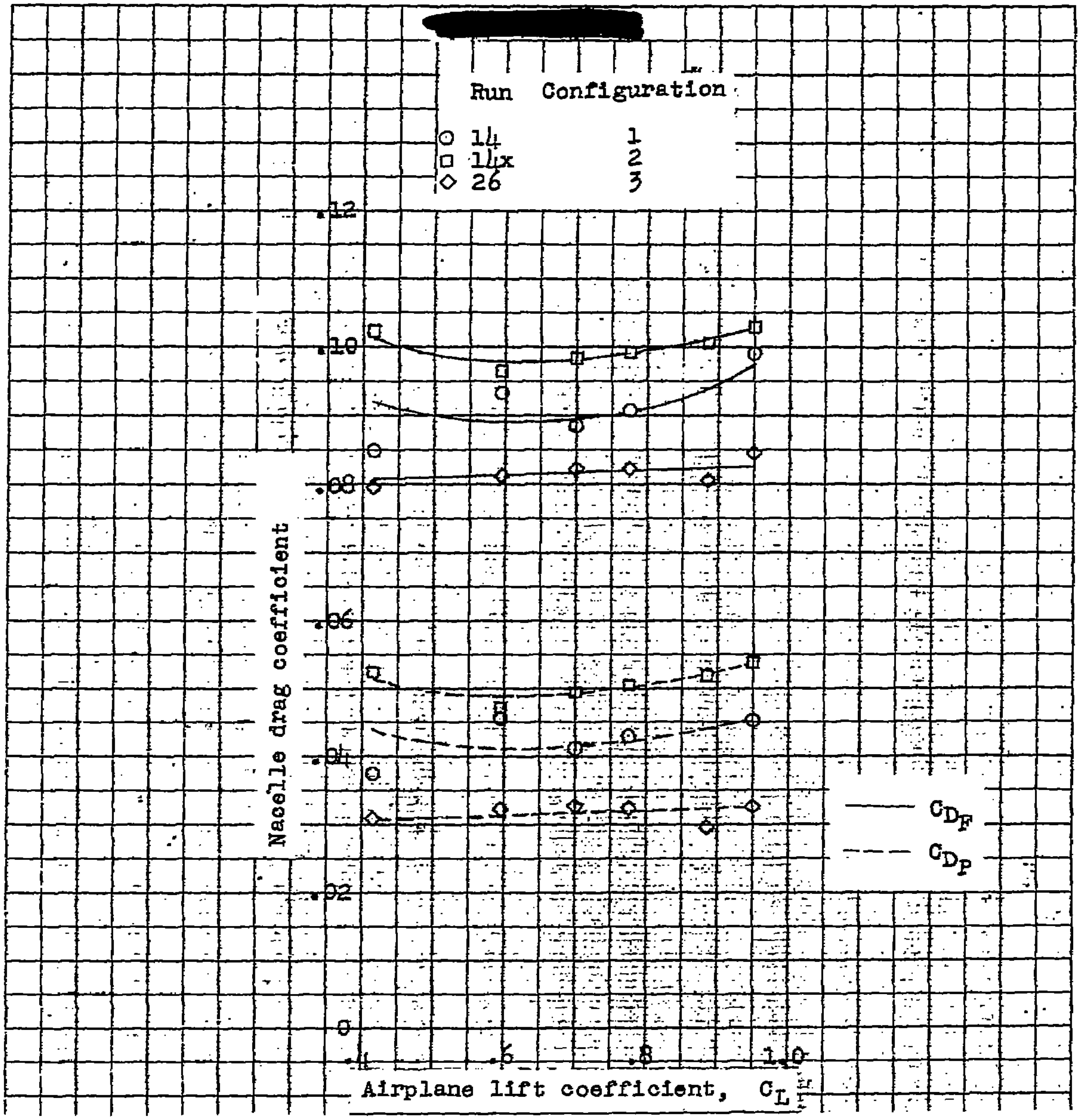

Figure 20.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. Maximum flow condition; $R \cong 2.5 \times 10^6$. LTT tests 329, 331, and 351.

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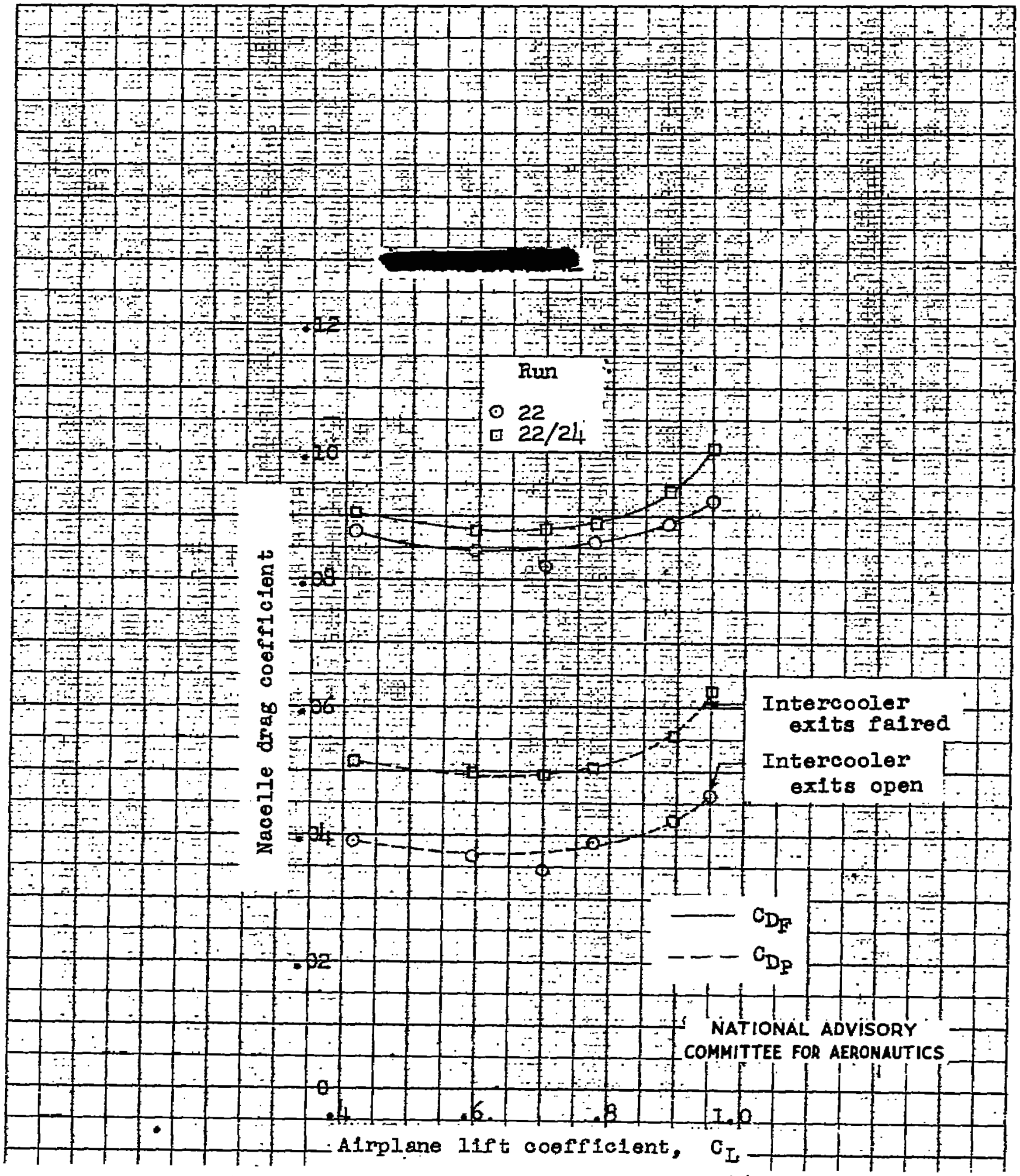

Figure 21.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle (exclusive of engine charge air) based on model nacelle frontal area. Configuration 2; $R \approx 2.5 \times 10^6$. LTT test 331.

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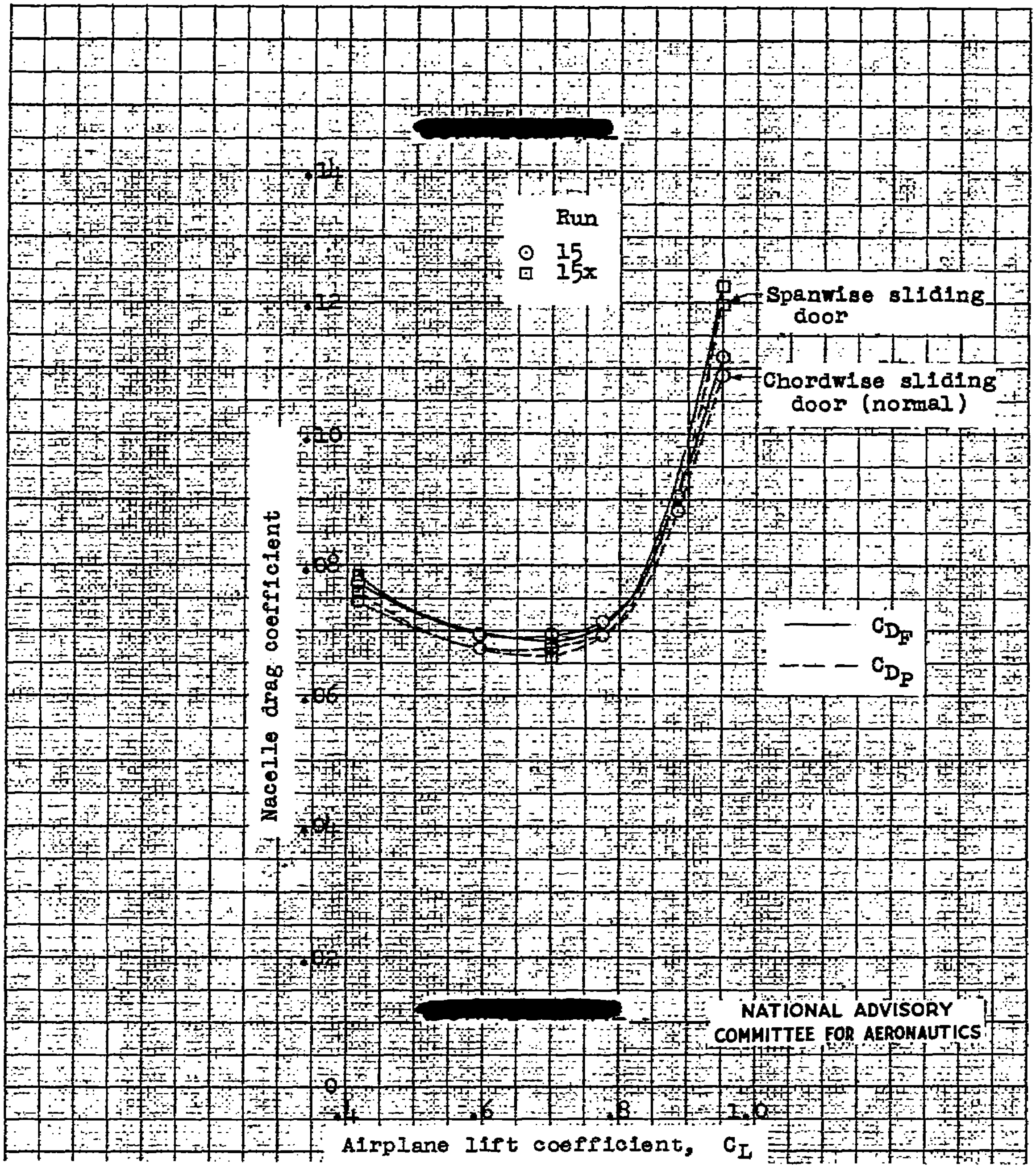

Figure 22.- Effects on nacelle drag of normal and spanwise sliding doors on the left hand intercooler cooling air duct exits; 1/14-scale model of XB-36 inboard nacelle. Configuration 2; low nacelle air flow; $R \cong 2.5 \times 10^6$. LTT test 331.

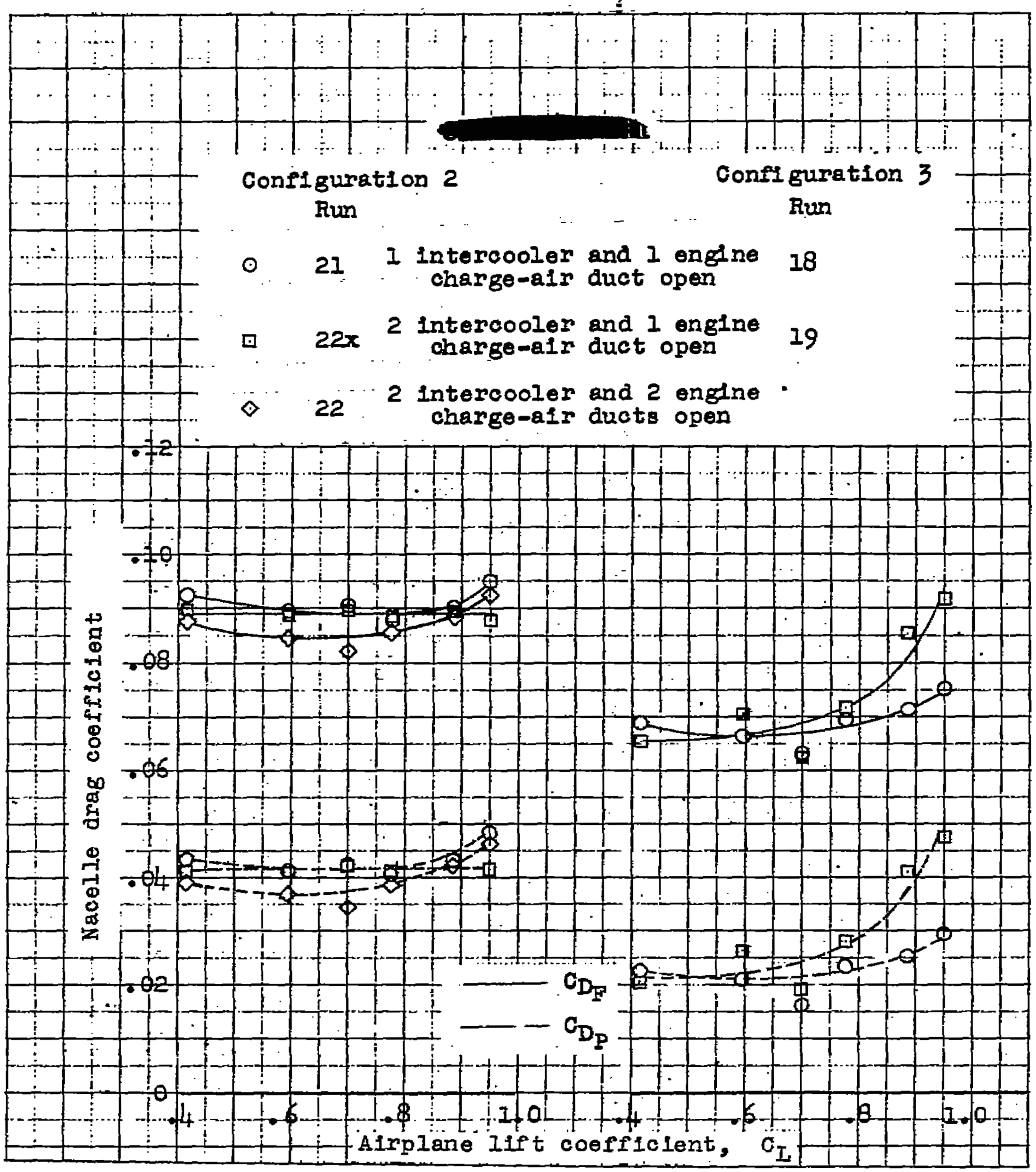

Figure 23.- Effect on nacelle drag due to closing in varying combinations, the exits of the intercooler and engine charge-air ducts; 1/14-scale model of the XB-36 inboard nacelle. $R \cong 2.5 \times 10^6$; LTT test 331.

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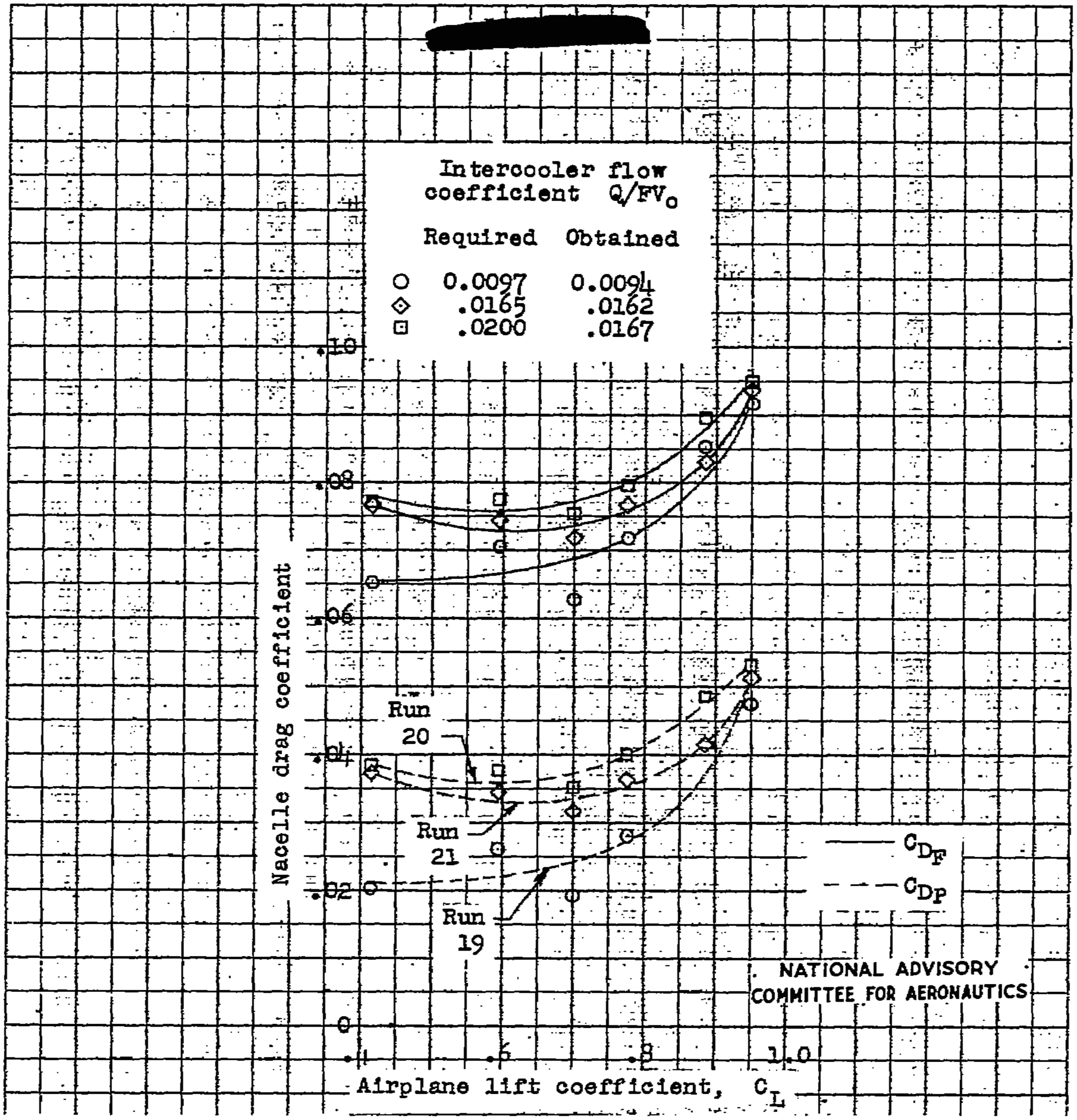

Figure 24.- Effect on nacelle drag of increased flow through the intercooler ducts; 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; $R \cong 2.5 \times 10^6$. LTT test 351.

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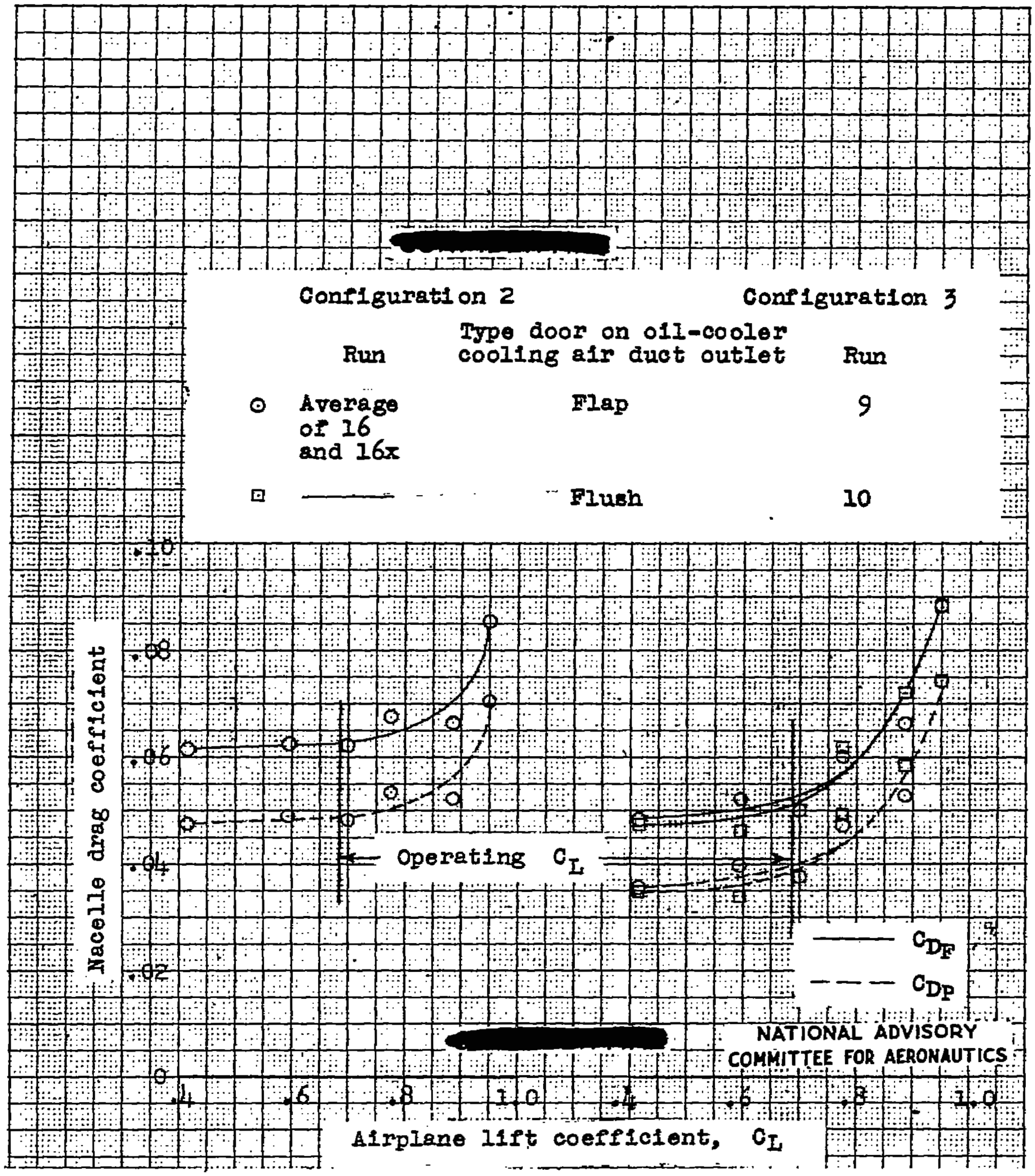
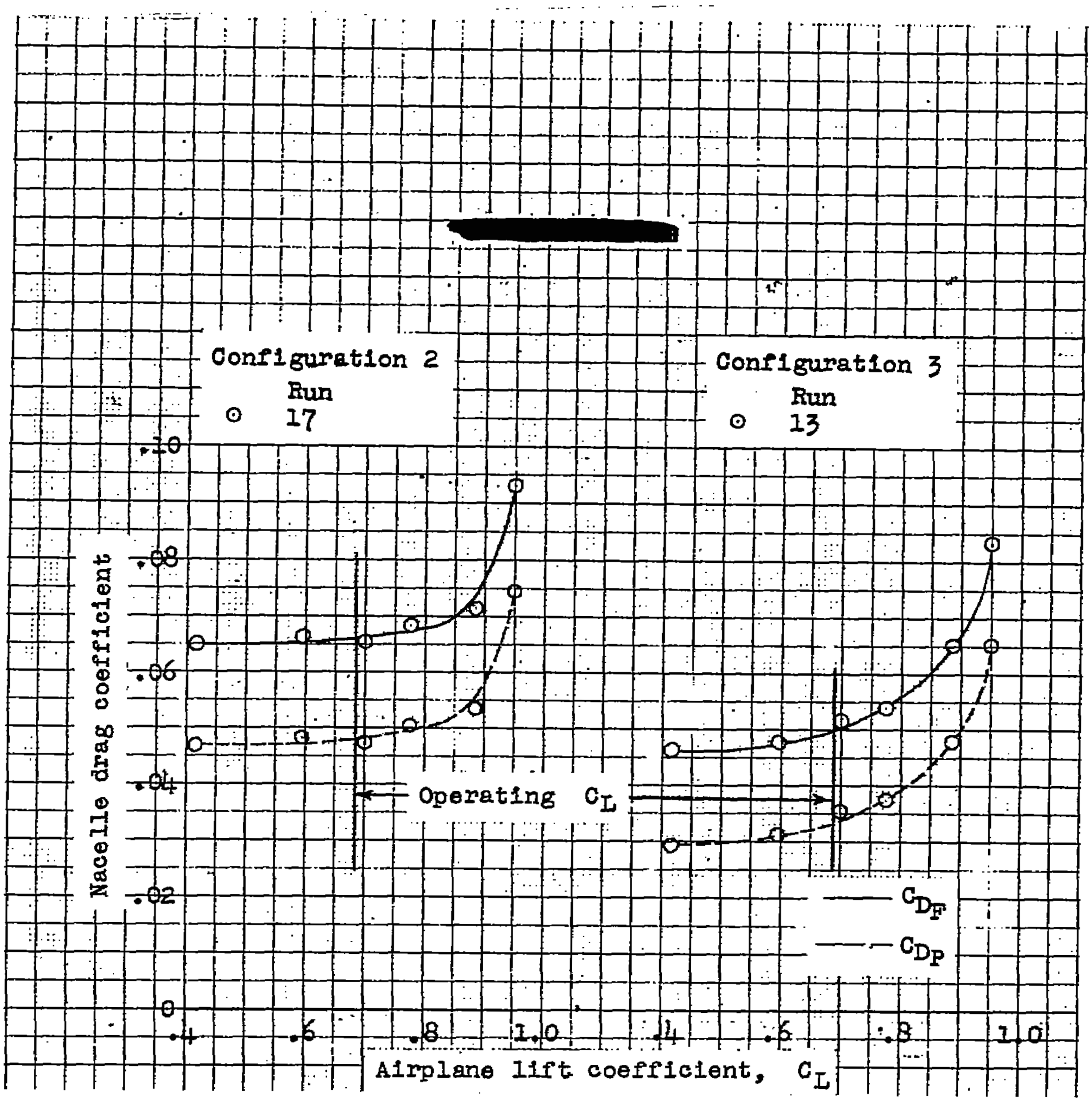


(a) 10,000 feet.

Figure 25.- Drag comparison of configurations 2 and 3; 1/14-scale model of the XB-36 inboard nacelle. Cruise condition at varying altitudes, $R \cong 2.5 \times 10^6$.



(b) 20,000 feet.

Figure 25.- Continued

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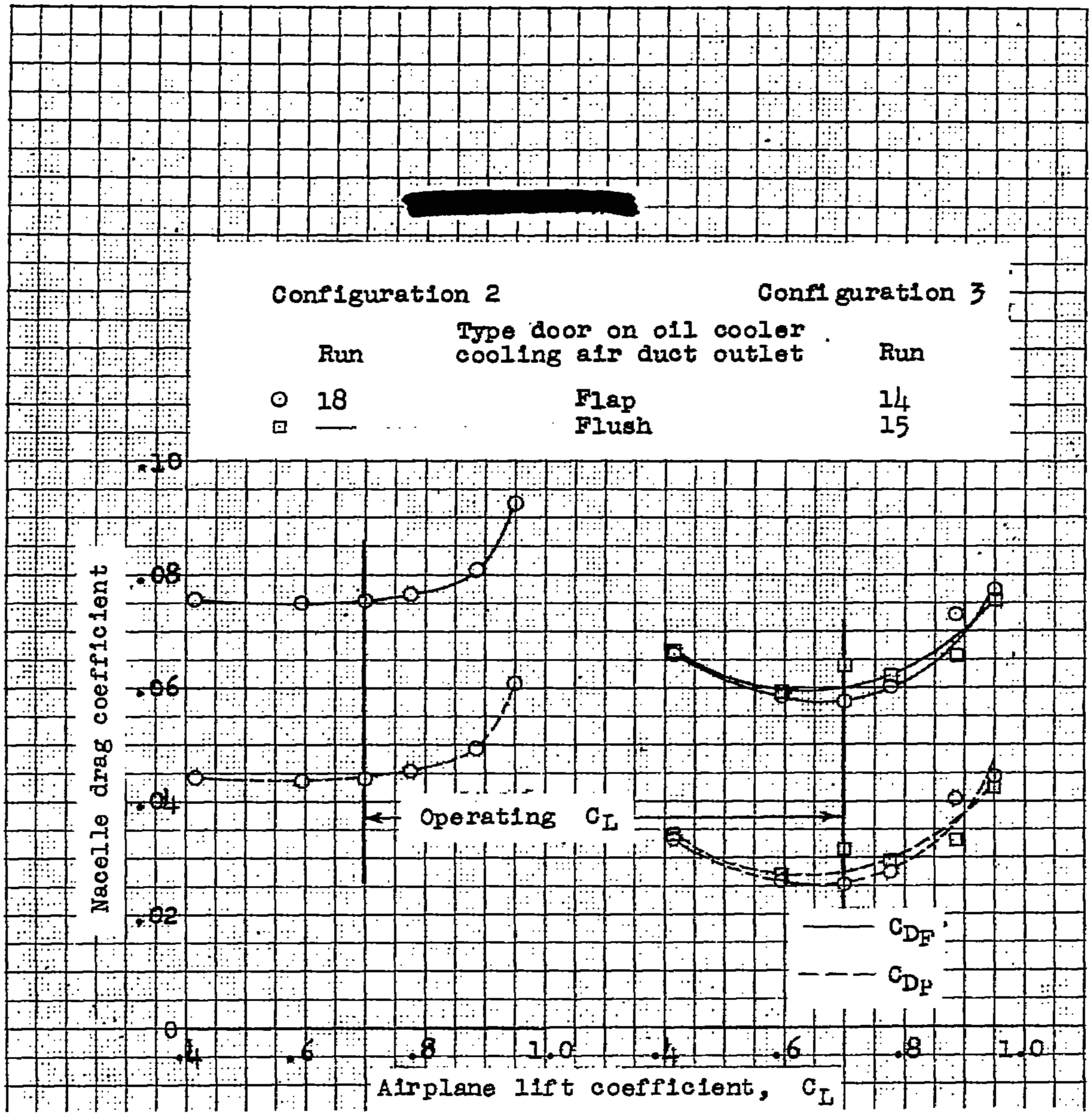

(c) 30,000 feet.

Figure 25.- Continued.

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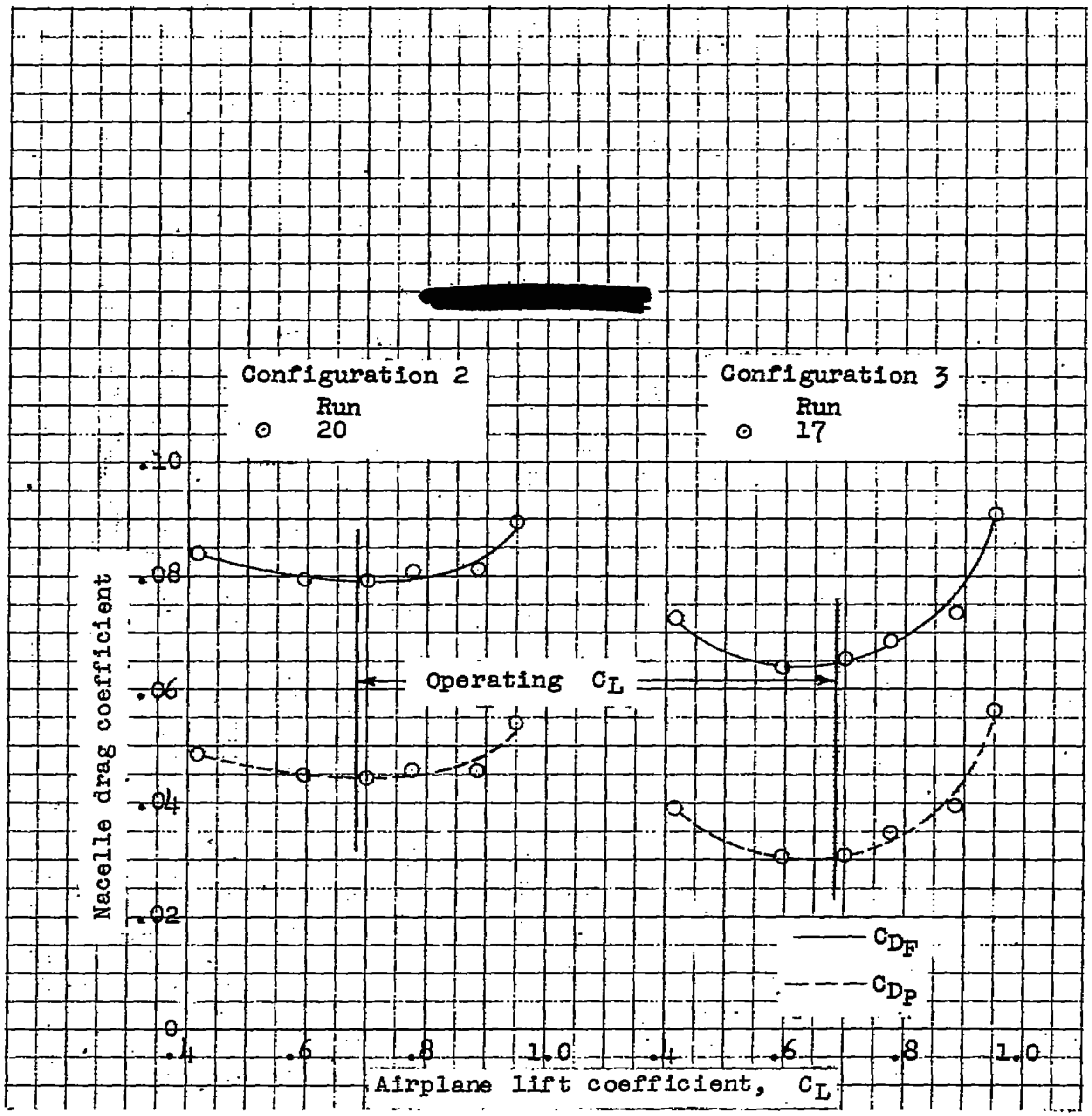

(d) 35,000 feet.

Figure 25.- Continued.

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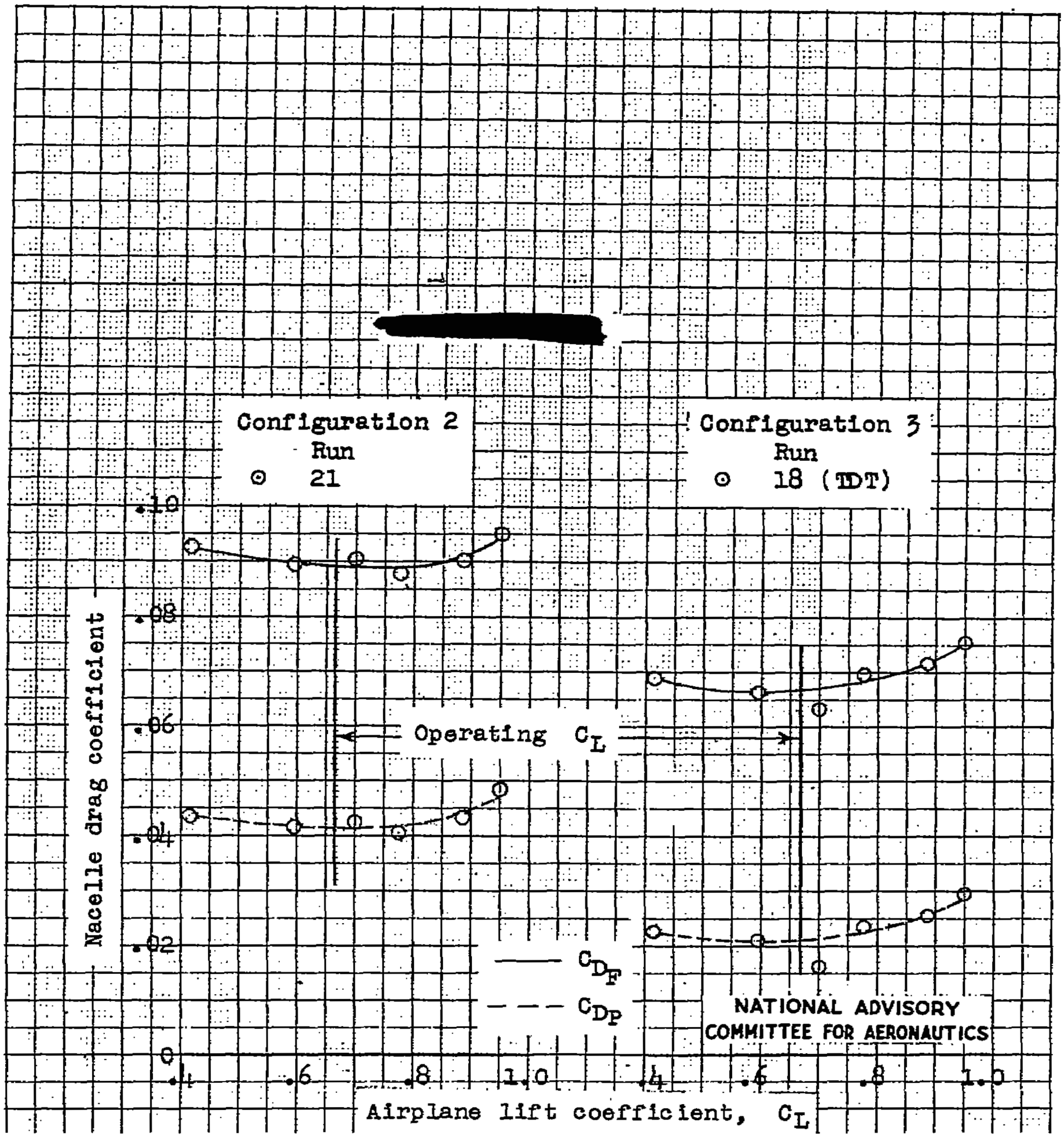

(e) 40,000 feet.

Figure 25.- Concluded.

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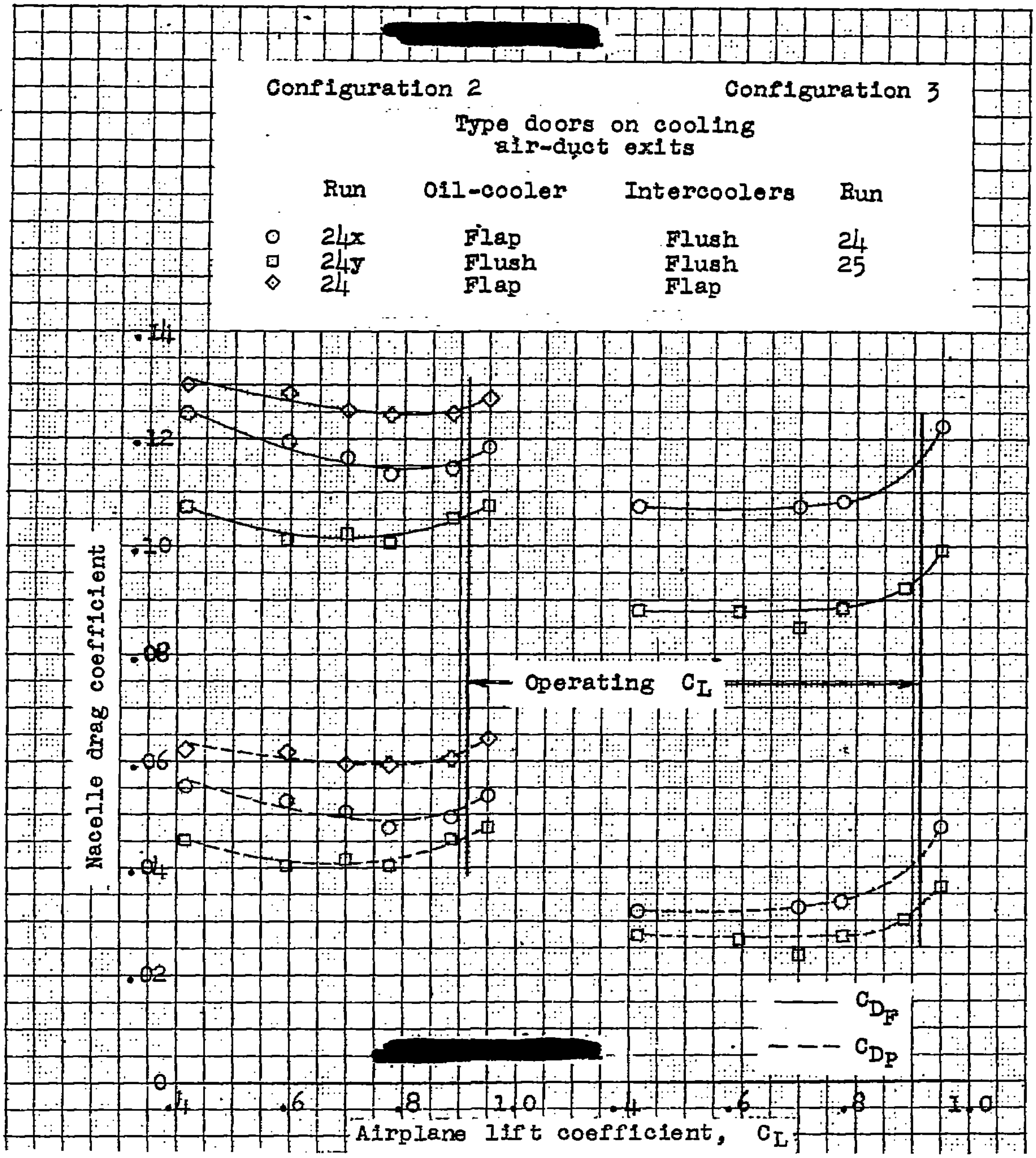

Figure 26.- Comparison of drag effects of configurations 2 and 3 with different types of doors on the oil-cooler and intercooler cooling-air duct exits; climb condition at 40,000 feet. $R \cong 2.5 \times 10^6$; LTT tests 331 and 351.

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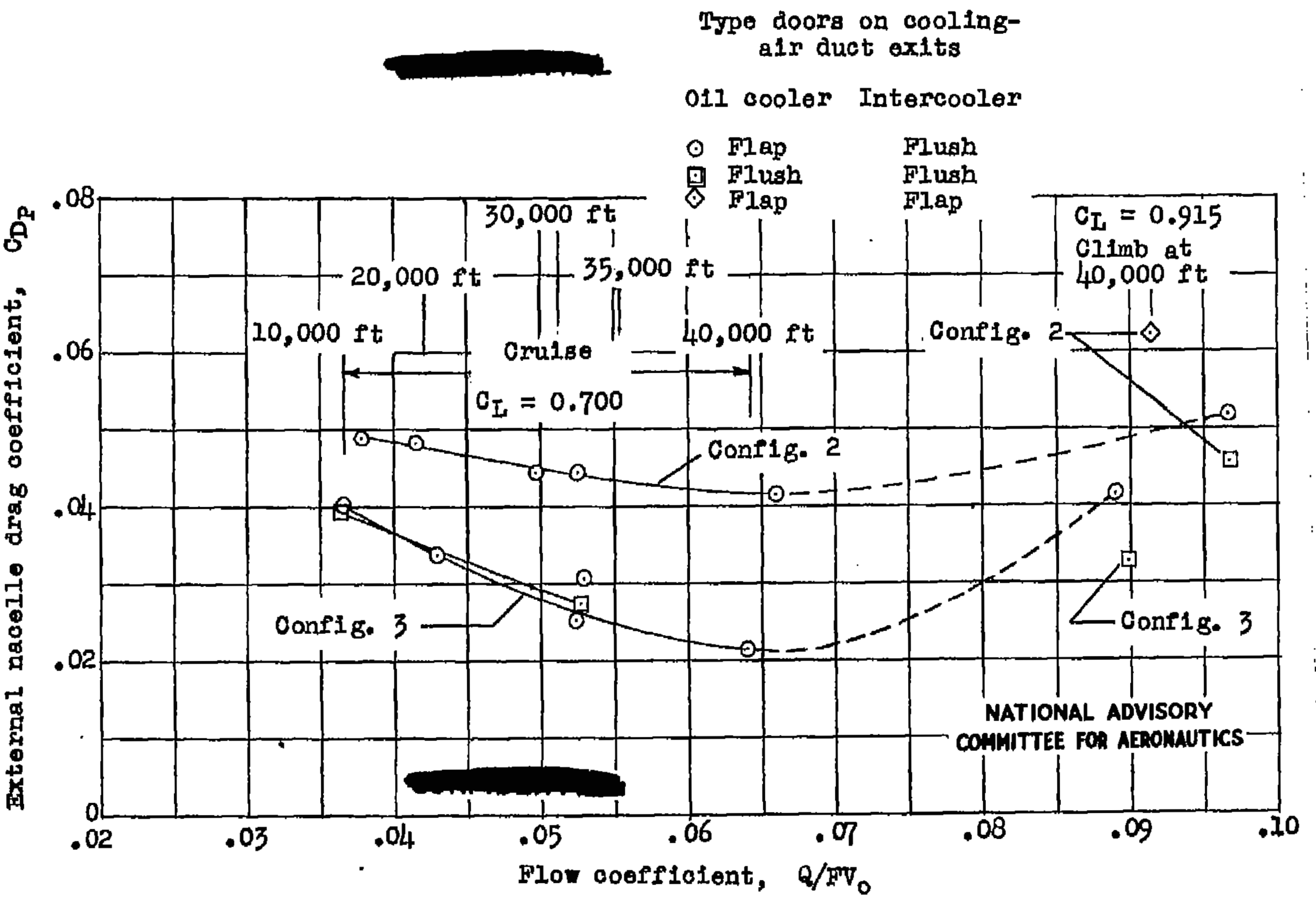

Figure 27.- Variation of external nacelle drag with flow coefficient for cruise and climb with different types of doors on the oil cooler and intercooler cooling-air duct exits. $R \cong 2.5 \times 10^6$.

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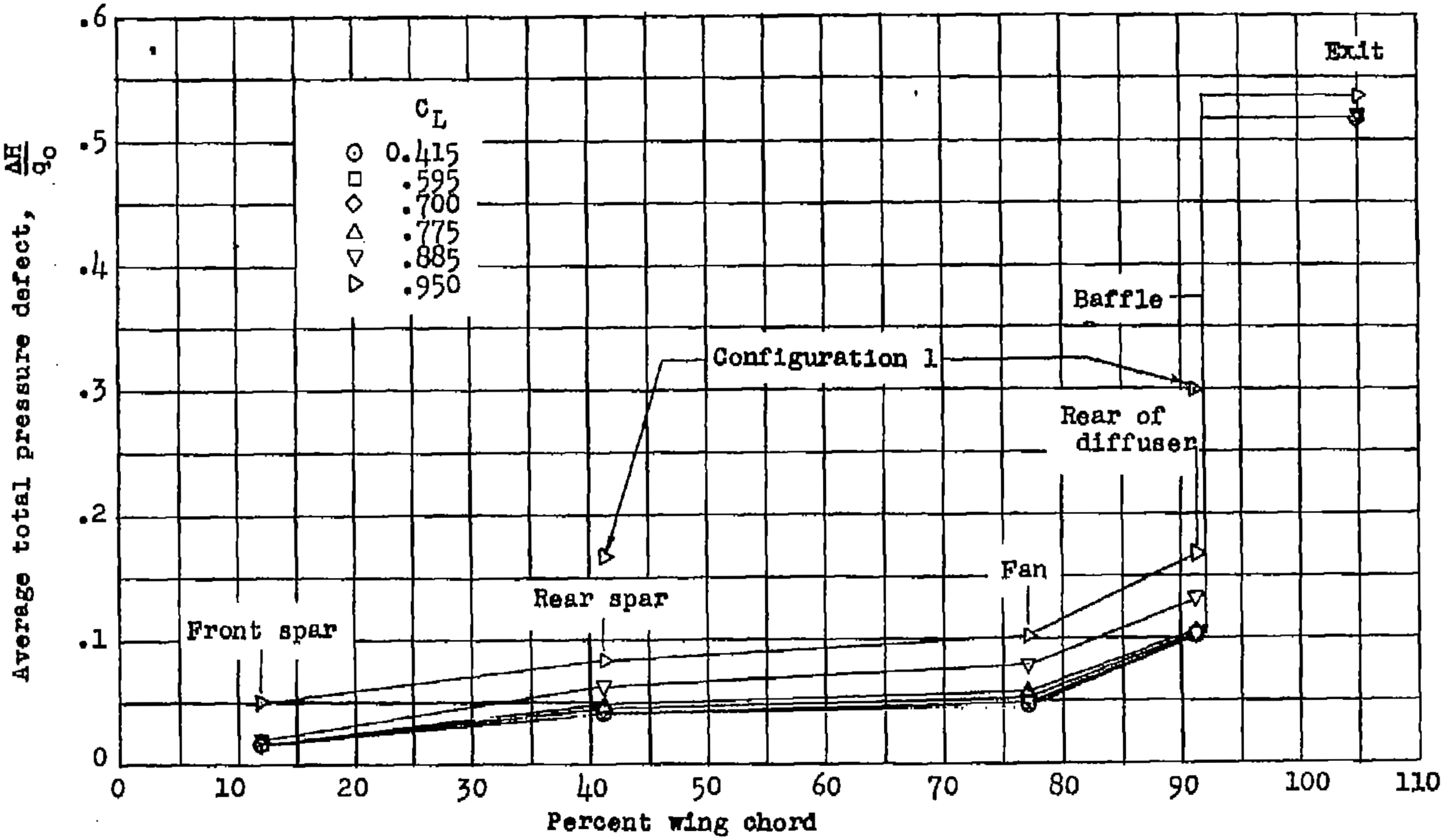

(a) High-speed condition at 30,000 feet; run 22.

Figure 28.- Average total pressure defect at several chordwise positions within the engine air duct; 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; $R \cong 2.5 \times 10^6$; LTT test 351.

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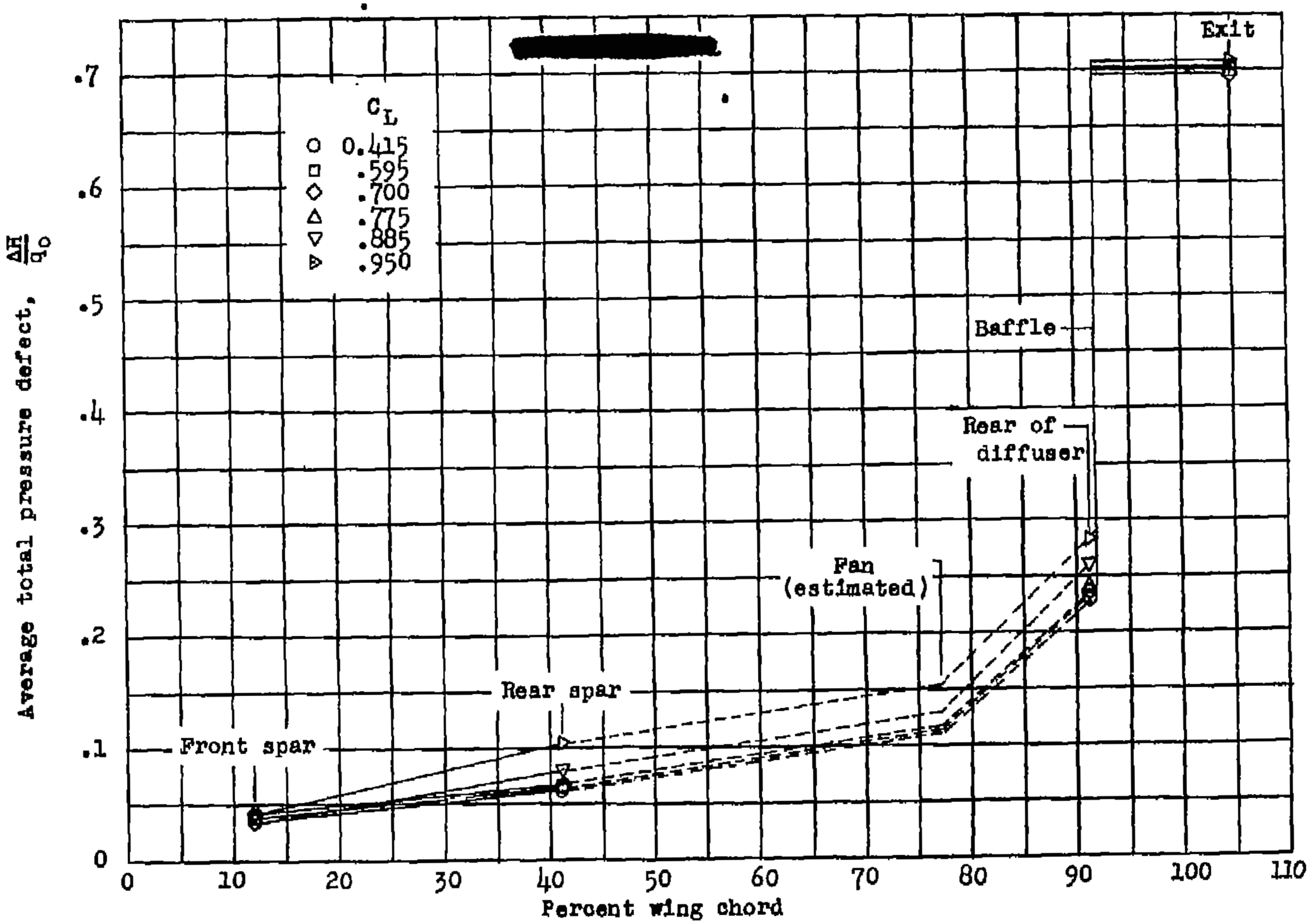

(b) Climb condition at 40,000 feet; run 24.

Figure 28.- Concluded.

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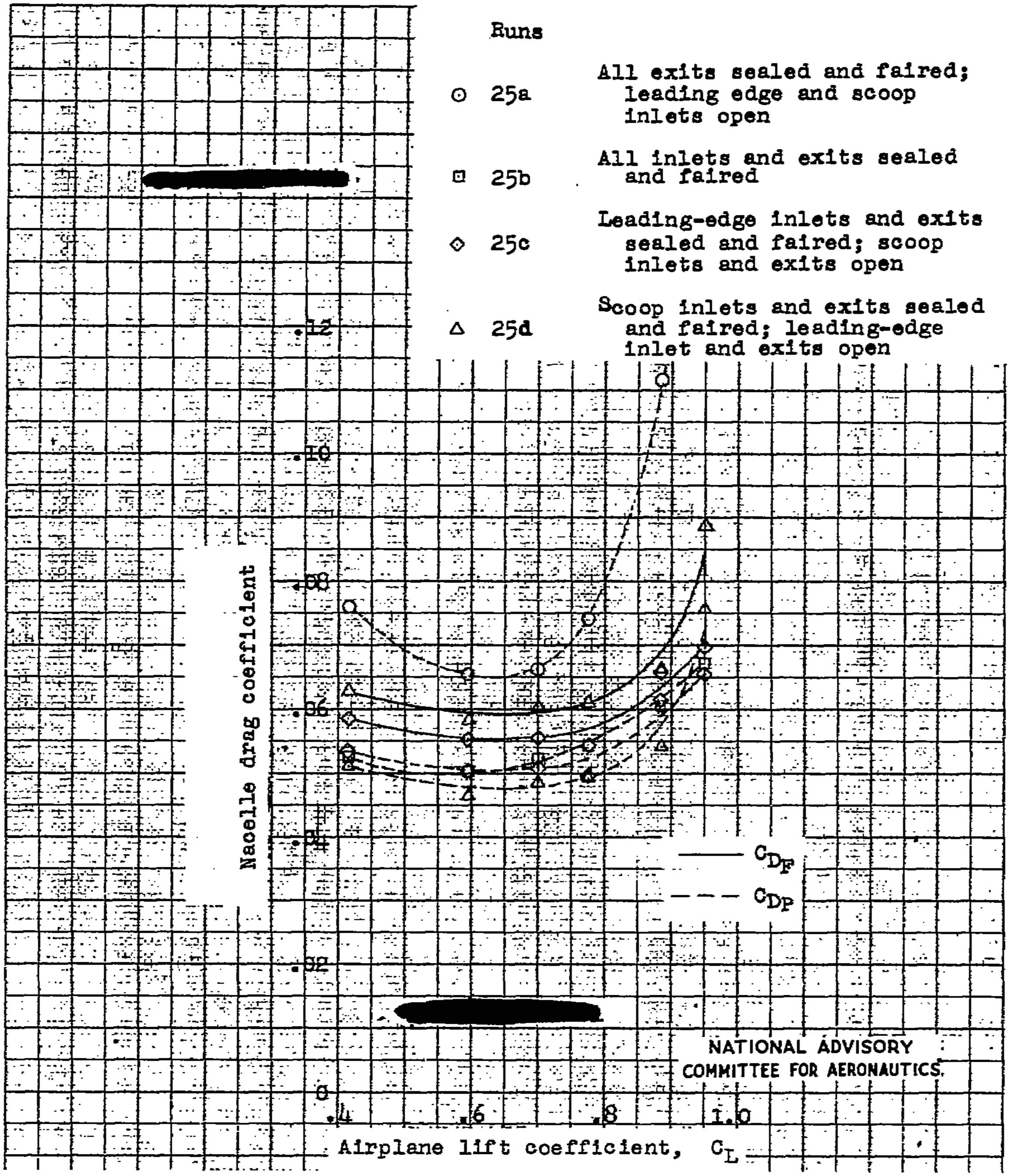

Figure 29.- Effects on nacelle drag of no and partial flow through ducting system of 1/14-scale model of the XB-36 inboard nacelle; configuration 2; $R \cong 2.5 \times 10^6$. LTT test 331.

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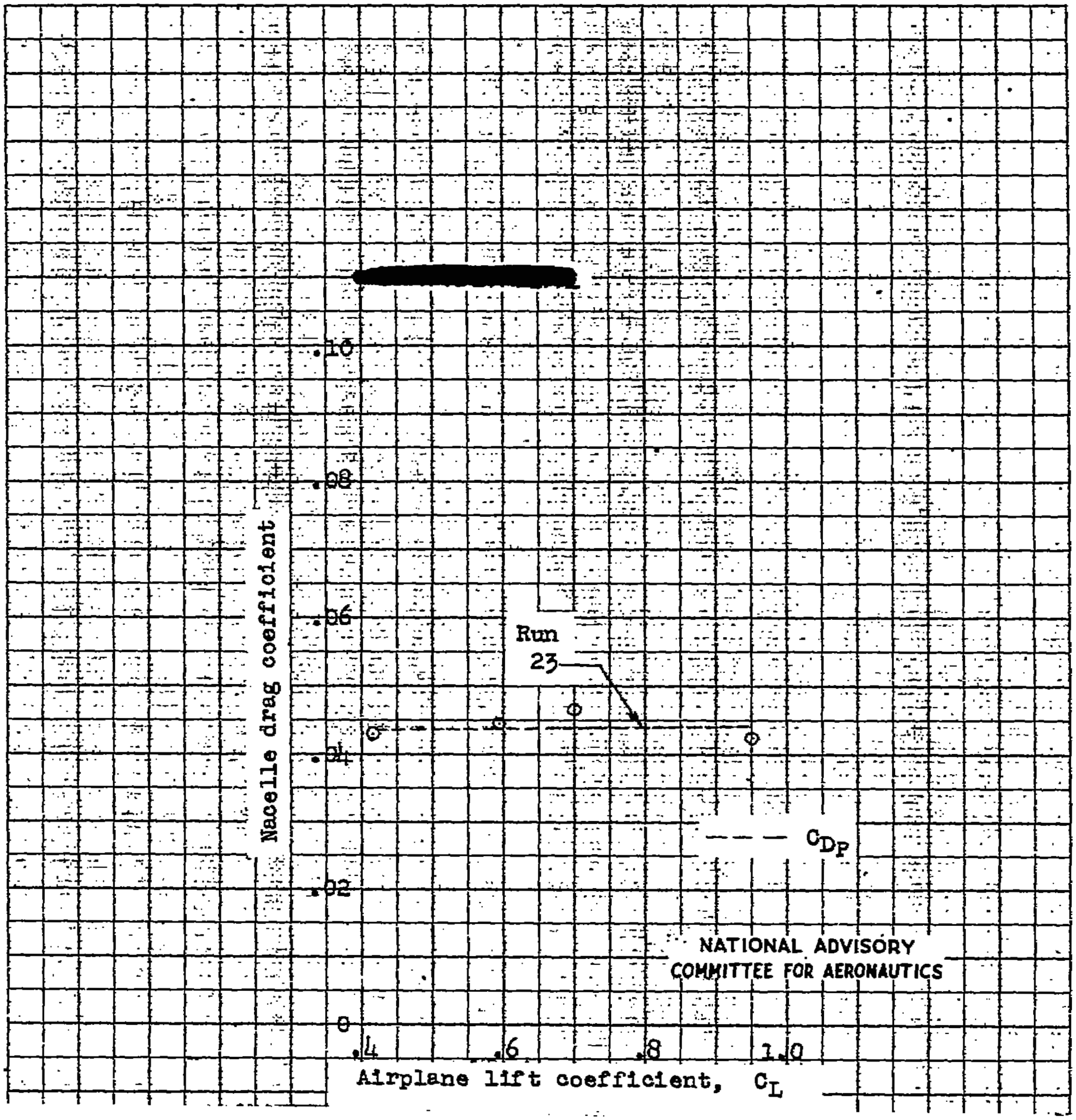

Figure 30.- Drag characteristics of 1/14-scale model of the XB-36 inboard nacelle with all air inlets and exits sealed and faired. Configuration 3; $R \cong 2.5 \times 10^6$; LTT test 351.

[redacted]

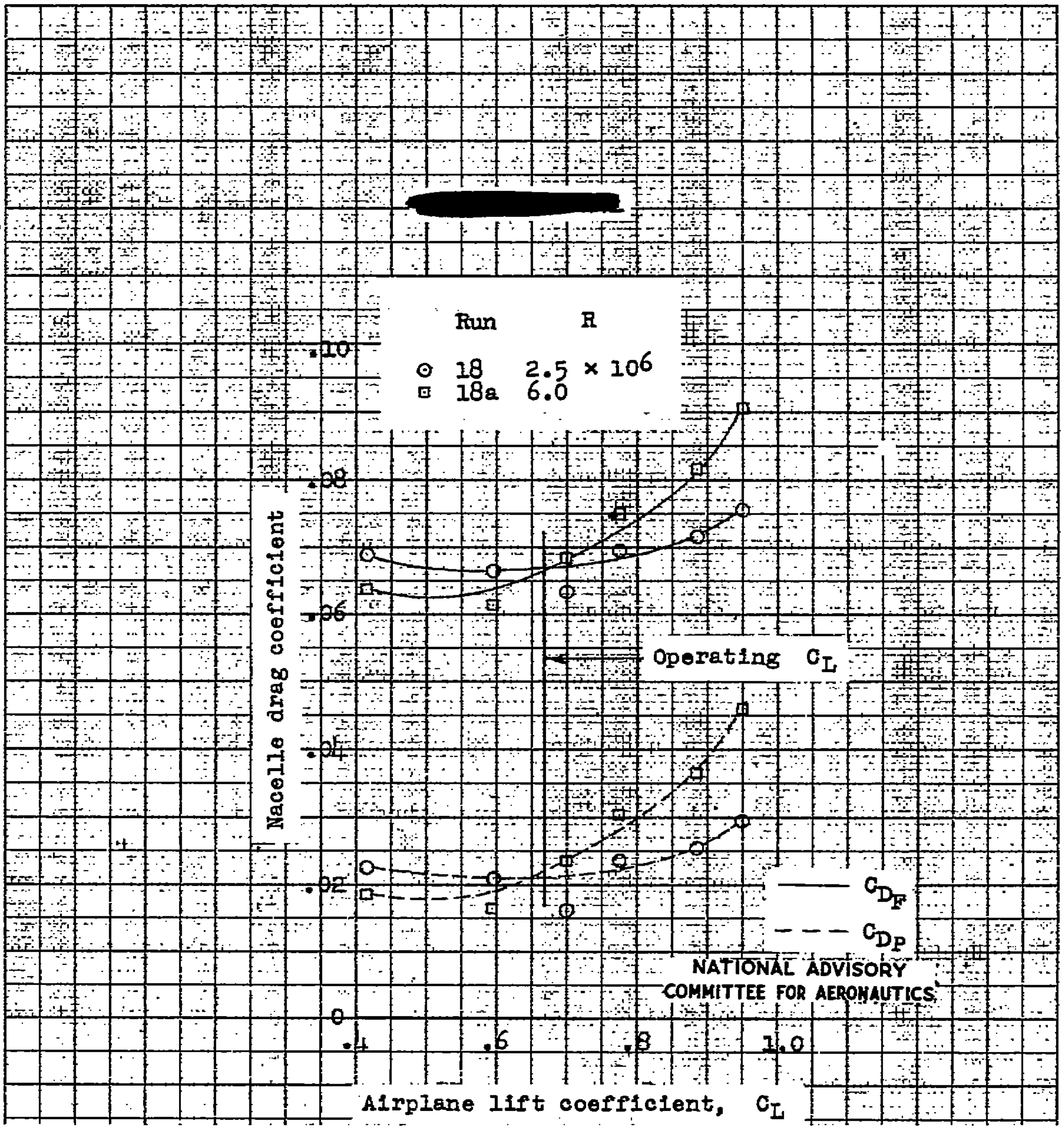

Figure 31.- Drag scale effect of 1/14-scale model of the XB-36 inboard nacelle. Configuration 3; cruise condition at 40,000 feet. TDT test 723.

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